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ABSTRACT

A longitudinal study was designed to determine whether there were significant differences in academic achievement between senior high American Indian students in Federal on-reservation, Federal off-reservation, public on-reservation, and public off-reservation schools. The purpose of the study was to gather a variety of data on psychological and sociological variables and to investigate the relationship of those variables to achievement. A sample of students drawn from 21 high schools in 7 states was stratified on the basis of sex, grade, and geographic area, with approximately equal sex ratios. Tests administered at various times over a 4-year period (1966-70) were: the California Achievement Tests; the California Short-Form Test of Mental Maturity; the Mooney Problem Check List; a questionnaire to obtain personal and familial data; a semantic differential on attitudes; the School Interest Inventory; the California Psychological Inventory; the Value Orientation Scale; and the Vocational Aspiration Scale. No reliable differences were noted in terms of achievement between the 4 types of schools. For the 45 categories for which significant achievement differences were registered, rankings were so variable that no hierarchial pattern or evidence of particular superiority or inferiority emerged. Appendices include tables of mean scores of criterion and control variables with analysis of covariance and adjusted criterion means by school type and by geographic area. (FF)

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AN ANALYSIS OF ACADEMIC ACHIEVEMENT OF INDIAN HIGH SCHOOL STUDENTS IN FEDERAL AND PUBLIC SCHOOLS

by

Willard P. Bass

Southwestern Cooperative Educational Laboratory
1404 San Mateo Blvd., S. E.
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This report is the culmination of nearly five years of gathering, processing, and analyzing data. Literally hundreds of people have contributed in some measure to the project. Obviously, it is not practicable to name them all, or even to attempt to make personal mention of the scores of those who deserve special recognition.

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I. INTRODUCTION

The major concern of this longitudinal study was to determine whether academic achievement differs significantly for American Indian students enrolled in four types of schools: (1) federal on-reservation, (2) federal off-reservation, (3) public on-reservation, (4) public off-reservation. Other important interests were to examine differences in academic achievement by geographic area, grade, and sex. In addition, it was the purpose of the study to gather a variety of data on other psychological and sociological variables and to investigate the relationship of some of them to achievement.

Of the numerous studies that have been made of academic achievement of American Indian students, only a few have examined levels of achievement in various types of schools, notably the extensive study by Coombs who found that Indian students who were enrolled in public schools achieved at a higher level on the average than did those enrolled in Bureau of Indian Affairs (BIA) schools. However, since initial individual differences were not controlled statistically, differences in group achievement could not be attributed to the educational experiences provided to students by the schools. Although Coombs was careful to point out that differences in socioeconomic backgrounds of the students in the groups being compared may have accounted for the disparity in achievement levels, it became almost axiomatic, as a result of the findings of the study, that an Indian student would make greater academic progress in a public school than in a BIA school.[1]

In this present study, individual differences were taken into consideration in comparing academic achievement of various groups. To provide a measure of control of individual differences influencing achievement the statistical technique of analysis of covariance was employed so that the differences in achievement could be attributed to the treatments being tested.

REFERENCES

1. Coombs, L. Madison, et al. The Indian Child Goes to School. U. S. Department of the Interior, Bureau of Indian Affairs, Washington, D.C., 1958.

II. METHOD

The Sample

In the fall of 1966 a sample of American Indian high school students was drawn from 21 schools located in the seven states of Alaska, Arizona, Nebraska, New Mexico, Oklahoma, South Dakota, and Utah. Approximately equal numbers were drawn from each of the four school types: federal on-reservation, federal off-reservation, public on-reservation, and public off-reservation. The sample was also stratified on the basis of sex, grade, and geographic area, with approximately equal numbers of male and female, and with 34% coming from grade nine, 28% from grade ten, 20% from grade eleven, and 18% from grade twelve. The sample included all Indian students enrolled in certain schools and a random selection of students from other schools and was drawn so as to provide representation from certain Bureau of Indian Affairs administrative areas proportionate to the numbers of students enrolled in federal schools in those areas. This sample, numbering 3,346 students, was pretested in the fall of 1966. In the spring of 1967 testing sessions were held again in all of the same schools, at which time it proved possible to obtain usable post-test results for 2,584 of those who had been pretested in the fall. This group of 2,584 subjects, who were administered both pretests and post-tests, then comprised the sample for the first year of the study.

Insufficient time to make necessary arrangements, considering certain difficulties encountered, made it impossible to include public school native

Alaskan students in the sample for the first year of the study. However, this situation was corrected and students enrolled in two public schools were added to the sample for the succeeding years of the study.

In the fall of 1967 a total of 3,375 Indian students was tested. Of these, a substantial number were ninth grade students brought into the sample for the first time, while the others were principally students who had been tested the previous school year. In the spring of 1968 a total of 2,556 Indian students was tested. Of this number, complete and usable data for both the fall pretest and the spring post-test were obtained for 1,928 Indian students.

The next testing session was held in the spring of 1969. No new ninth grade students were added to the sample at this time. Data were sought only on students who had been tested at some prior time in the study. This, of course, limited the spring of 1969 sample to tenth, eleventh, and twelfth grade students. Data were obtained for 1,377 students in the 1969 spring testing.

The final testing was accomplished in the spring of 1970, and again was confined to students who had been tested previously, thus limiting the sample to eleventh grade and twelfth grade students. Of the 1,377 students tested in the spring of 1969, it was possible to test 837 again in the spring of 1970.

Measuring Instruments

The following tests were administered during the course of the study.

Fall, 1966:

California Achievement Tests (CAT), Advanced, Complete Battery, 1957 Edition, 1963 Norms, Form W.

California Short-Form Test of Mental Maturity (CTMM), 1963 Level 4.

Mooney Problem Check List (Abbreviated Version), Form J-SH.

Questionnaire.

Spring, 1967:

CAT, Form X.

Fall, 1967:

CAT, Form Y.

CTMM. Administered to all ninth grade students and to Alaska public school students, grades 10-12, new to the sample.

Questionnaire. Administered to all ninth grade students and to Alaska public school students, grades 10-12, new to the sample.

Semantic Differential.

Spring, 1968:

CAT, Form W.

School Interest Inventory, by William Cottle, published by Houghton Mifflin Company, 1966.

Spring, 1969:

CAT, Form X.

California Psychological Inventory. Five measures: CS (Capacity for Status), SP (Social Presence), AC (Achievement via Conformance), SA (Self-Acceptance), and AI (Achievement via Independence).

Value Orientation Scale

Spring, 1970:

CAT, Form Y.

Vocational Aspiration Scale.

Testing Procedures

Each of the six testing sessions was completed in one day at each school. All testing each fall was accomplished within a period of about two weeks during late September and early October. Spring testing was done during the latter half of April.

In each geographic area testing was under the supervision of a trained and experienced psychometrician who either administered the tests or trained and supervised others, all of whom had previous experience in testing.

Analysis of Data

In comparing groups within the sample on the basis of academic achievement, post-test California Achievement Test (CAT) raw scores were used as a criterion and differences in means were tested for significance by analysis of covariance. Since individual differences in scholastic aptitude and in academic ability could conceivably influence criterion scores, pretest intelligence and achievement scores were used as control variables. The California Test of Mental Maturity (CTMM) intelligence quotient scores were used as a scholastic aptitude control, and the pretest California Achievement Test (CAT) raw scores were used as a prior achievement control.

III. ACADEMIC ACHIEVEMENT BY SCHOOL TYPES

One-Year Analyses

Since achievement tests were administered at six different points within a span of four school years it was possible to analyze achievement for the following one-year periods:

Fall 1966 (pretest) - Spring 1967 (post-test)
Fall 1967 (pretest) - Spring 1968 (post-test)
Spring 1968 (pretest) - Spring 1969 (post-test)
Spring 1969 (pretest) - Spring 1970 (post-test)

Table 1 presents the mean raw scores of the criterion and control variables for reading, mathematics, language, and total battery, by school types, for ninth grade students who were pretested in the fall of 1966 and post-tested in the spring of 1967. Also presented in Table 1 are analysis of covariance figures and adjusted criterion means.

The F scores of 12.82, 18.73, 4.67, and 19.84 with 3 and 868 degrees of freedom are all significant beyond the 1% level. Therefore, there is little doubt that the ninth grade students enrolled in the four types of schools differed significantly in achievement during the 1966-67 school year. Since significant F values were found, it is appropriate to compute adjusted criterion means for each school type. In similar succeeding tables, whenever differences in criterion means are not found to be significant, adjusted means are not presented.

In order to avoid burdening the body of the report with tables, the remaining mean raw scores, analysis of covariance, and, where appropriate, adjusted criterion means, by grade and school type, for each of the one-year measurement periods are presented in Tables A1-A12 in Appendix A.

Table 1

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF NINTH GRADE STUDENTS BY SCHOOL TYPE 1966-67

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1) Federal on-reservation	218	81	50.84	44.35	63.96	57.28	94.38	82.35	209.19	183.98
2) Federal off-reservation	232	78	47.45	42.53	61.05	54.63	93.12	82.36	201.61	179.53
3) Public on-reservation	213	84	50.98	46.41	64.60	61.31	98.24	91.54	213.83	199.26
4) Public off-reservation	211	87	48.34	46.23	59.04	59.47	97.30	88.56	204.69	194.26

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	871	77702			140410			125557			547810		
Within Groups	868	74405	86		131872	152		123564	142		512659	591	
Difference	3	3297	1099	12.8*	8538	2846	18.7*	1993	664	4.7*	35151	11717	19.8*

ADJUSTED CRITERION MEANS

School Type	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	50.84	+0.70	51.54	63.96	+0.94	64.90	94.38	+2.98	97.36	209.19	+ 4.95	214.14
2) Federal off-reservation	47.45	+2.63	50.08	61.05	+3.65	64.70	93.12	+3.91	97.03	201.61	+10.32	211.93
3) Public on-reservation	50.98	-1.37	49.61	64.60	-2.86	61.74	98.24	-4.17	94.07	213.82	- 9.32	204.50
4) Public off-reservation	48.34	-2.23	46.11	59.04	-2.10	56.94	97.30	-3.17	94.13	204.69	- 7.06	197.63

*Significant at the .01 level.

Table 2

ADJUSTED CRITERION ACHIEVEMENT MEANS AND RANKINGS
BY GRADE AND SCHOOL TYPE
ONE-YEAR ANALYSES

		1966-67				1967-68				1968-69			1969-70	
		9	10	11	12	9	10	11	12	10	11	12	11	12
		READING												
1	Federal on-reservation	51.5 (1)	57.0 (1)	x	x	48.7 (1)	x	x	x	x	x	x	x	x
2	Federal off reservation	50.1 (2)	54.5 (4)	x	x	47.5 (3)	x	x	x	x	x	x	x	x
3	Public on-reservation	49.6 (3)	55.4 (2)	x	x	48.3 (2)	x	x	x	x	x	x	x	x
4	Public off-reservation	46.1 (4)	54.7 (3)	x	x	45.5 (4)	x	x	x	x	x	x	x	x
		MATHEMATICS												
1	Federal on-reservation	64.9 (1)	67.9 (2)	72.2 (2)	78.1 (2)	x	72.1 (2)	x	x	x	73.5 (3)	78.4 (2)	x	x
2	Federal off reservation	64.7 (2)	70.1 (1)	73.4 (1)	80.0 (1)	x	76.1 (1)	x	x	x	71.0 (4)	73.9 (4)	x	x
3	Public on-reservation	61.7 (3)	67.6 (3)	71.9 (3)	74.4 (4)	x	71.8 (3)	x	x	x	77.1 (2)	78.7 (1)	x	x
4	Public off-reservation	56.9 (4)	67.5 (4)	69.1 (4)	75.8 (3)	x	71.3 (4)	x	x	x	77.3 (1)	74.7 (3)	x	x
		LANGUAGE												
1	Federal on-reservation	97.4 (1)	x	x	118.5 (1)	x	101.8 (3)	x	x	104.4 (2)	111.8 (2)	x	108.5 (2)	x
2	Federal off reservation	97.0 (2)	x	x	116.7 (2)	x	99.6 (4)	x	x	107.0 (1)	112.0 (1)	x	107.5 (3)	x
3	Public on-reservation	94.1 (3)	x	x	111.0 (4)	x	104.1 (2)	x	x	103.1 (3)	108.4 (3)	x	105.8 (4)	x
4	Public off-reservation	94.1 (3)	x	x	111.9 (3)	x	105.0 (1)	x	x	102.2 (4)	107.7 (4)	x	113.3 (1)	x
		TOTAL BATTERY												
1	Federal on-reservation	214.1 (1)	x	x	261.4 (2)	x	x	x	x	x	x	x	x	x
2	Federal off reservation	211.9 (2)	x	x	262.8 (1)	x	x	x	x	x	x	x	x	x
3	Public on-reservation	204.5 (3)	x	x	248.6 (4)	x	x	x	x	x	x	x	x	x
4	Public off-reservation	197.6 (4)	x	x	251.8 (3)	x	x	x	x	x	x	x	x	x

( ) Numbers in parentheses indicate rankings.

x No adjusted means or rankings are presented because differences in criterion scores were not significant at the .05 level.

A compilation of the adjusted criterion means found in Table 1 and in Tables A1-A12 is presented in Table 2. Rankings, by school types, are indicated in parentheses. Those categories for which achievement differences between school types were found not to be a significant (11th grade reading in 1966-67, 12th grade reading in 1966-67, 10th grade reading in 1967-68, etc.) are marked with the letter x.

An inspection of Table 2 reveals that significant achievement differences between school types occurred for only 18 of the 52 categories. A summary of the rankings appearing in Table 2 is presented in Table 3. The sums of the ranks (ΣR) reveal that the general ranking of school types from highest to lowest was: federal on-reservation (31), federal off-reservation (39), public on-reservation (53), public off-reservation (57).

Table 3

Summary of Rankings of School Types Based
Upon Adjusted Criterion Achievement Means

One-Year Analyses

School Type	1st	2nd	3rd	4th	ΣR	ΣR^2
Federal On-Reservation	7	9	2	0	31	961
Federal Off-Reservation	7	5	2	4	39	1521
Public On-Reservation	1	4	8	5	53	2809
Public Off-Reservation	3	0	6	9	57	3249

Total $\Sigma R^2 = 8540$

To test the differences in ranks for significance the Friedman Test, a form of rank order analysis of variance was employed. The formula is

$$X^2 = \frac{12}{kn\,(n+1)} \quad \Sigma R^2 - 3k\,(n+1)$$

where k is the number of rankings made (18) and n is the number of objects being ranked (4).

$$\text{Then } X^2 = \frac{12}{(18)(4)(5)} \quad 8540 - (3)(18)(5) = 14.66$$

Reference to an X^2 table reveals that a value of 14.66 with k-1=17 degrees of freedom is not significant at the .05 level.

To summarize, when individual differences in scholastic aptitude and academic ability were controlled, significant differences in one-year academic achievement between school types were found for only 18 of 52 categories of measurement and differences in the rankings of school types on those 18 categories were not significant. Apparently, academic achievement did not differ significantly between the four types of schools for the one-year time periods.

Two-Year Analyses

Achievement, by school types, was analyzed for the following two-year spans:

Fall 1966 (pretest) - Spring 1968 (post-test)
Fall 1967 (pretest) - Spring 1969 (post-test)
Spring 1968 (pretest) - Spring 1970 (post-test)

Tables A13 - A20 in the Appendix present the means of criterion and control variables, analysis of covariance and, where appropriate, adjusted criterion means, by school types, for each of the two-year measurement periods.

A summary of adjusted criterion achievement means by school types for two-year periods, taken from Tables A13 - A20 in the Appendix, is presented in Table 4. Significant differences in achievement between types of schools were found for 17 of the 32 categories of measurement, while differences were found not to be significant for 15 categories.

Table 4

ADJUSTED CRITERION ACHIEVEMENT MEANS AND RANKINGS
BY GRADE AND SCHOOL TYPE
TWO-YEAR ANALYSES

	Fall 1966-Spring 1968			Fall 1967-Spring 1968			Spring 68-Spg 70	
	9-10	10-11	11-12	9-10	10-11	11-12	9-11	10-12
	READING							
1) Federal on-reservation	57.3 (1)	x	65.2 (2)	x	x	x	56.0 (4)	63.6 (2)
2) Federal off-reservation	55.7 (2)	x	66.3 (1)	x	x	x	60.1 (1)	62.7 (3)
3) Public on-reservation	53.5 (4)	x	61.8 (3)	x	x	x	58.5 (3)	65.3 (1)
4) Public off-reservation	53.8 (3)	x	61.6 (4)	x	x	x	59.1 (2)	60.0 (4)
	MATHEMATICS							
1) Federal on-reservation	74.9 (2)	x	x	61.0 (4)	69.4 (4)	76.5 (1)	68.5 (4)	77.3 (3)
2) Federal off-reservation	75.3 (1)	x	x	64.3 (3)	70.2 (3)	73.1 (3)	70.8 (3)	73.4 (4)
3) Public on-reservation	70.3 (4)	x	x	66.2 (1)	74.6 (1)	75.9 (2)	74.5 (1)	83.4 (1)
4) Public off-reservation	70.4 (3)	x	x	64.4 (2)	73.6 (2)	72.0 (4)	72.3 (2)	81.8 (2)
	LANGUAGE							
1) Federal on-reservation	105.4 (1)	x	x	x	x	116.1 (1)	108.7 (2)	x
2) Federal off-reservation	101.2 (4)	x	x	x	x	111.8 (4)	107.5 (3)	x
3) Public on-reservation	102.1 (2)	x	x	x	x	111.9 (3)	105.9 (4)	x
4) Public off-reservation	101.4 (3)	x	x	x	x	112.7 (2)	114.8 (1)	x
	TOTAL BATTERY							
1) Federal on-reservation	238.1 (1)	x	x	x	235.4 (4)	x	232.9 (4)	254.6 (3)
2) Federal off-reservation	232.1 (2)	x	x	x	235.8 (3)	x	237.1 (3)	247.6 (4)
3) Public on-reservation	225.5 (4)	x	x	x	244.1 (1)	x	239.5 (2)	260.7 (1)
4) Public off-reservation	225.7 (3)	x	x	x	240.4 (2)	x	247.7 (1)	255.8 (2)

( ) Numbers in parentheses indicate rankings.

x No adjusted criterion means or rankings are presented because differences in criterion scores were not significant at the .05 level.

Table 5 presents a summary of the rankings from Table 4. Based upon the sums of the ranks (ΣR) in Table 5, the general ranking of school types from highest to lowest was: public on-reservation (38) public off-reservation (42), federal on-reservation (43), federal off-reservation (47). However, differences in ranks which obviously are very slight, proved to be nonsignificant. Use of the Friedman Test yields an X^2 of only 1.44. With 16 degrees of freedom, this value falls far short of the X^2 of 26+ necessary for significance at the .05 level.

Table 5

Summary of Rankings of School Types Based
Upon Adjusted Criterion Achievement Means

Two-Year Analyses

School Type	1st	2nd	3rd	4th	ΣR
Federal On-Reservation	5	4	2	6	43
Federal Off-Reservation	3	2	8	4	47
Public On-Reservation	7	3	3	4	38
Public Off-Reservation	2	8	4	3	42

The evidence indicates that when individual differences in scholastic aptitude and academic ability were controlled there were not significant differences in two-year academic achievement between school types for 15 of the 32 categories measured, while for the 17 categories for which significant differences were found the rankings of school types were so mixed that no significant pattern of superiority emerged. Obviously, the two-year analyses do not indicate that academic achievement differed significantly between the four types of school.

Table 6

ADJUSTED CRITERION ACHIEVEMENT MEANS AND RANKINGS
BY GRADE AND SCHOOL TYPE
THREE AND FOUR YEAR ANALYSES

	THREE YEAR ANALYSIS				FOUR YEAR
	FALL 1966-SPRING 1969		FALL 1967-SPRING 1970		FALL 1966 SPRING 1970
	9th-11th	10th-12th	9th-11th	10th-12th	9th-12th
School Type	READING				
1) Federal on-reservation	x	x	56.3 (4)	x	x
2) Federal off-reservation	x	x	59.9 (1)	x	x
3) Public on-reservation	x	x	57.4 (3)	x	x
4) Public off-reservation	x	x	59.3 (2)	x	x
	MATHEMATICS				
1) Federal on-reservation	x	x	67.1 (4)	74.7 (3)	x
2) Federal off-reservation	x	x	71.2 (2)	74.7 (3)	x
3) Public on-reservation	x	x	72.2 (1)	80.1 (1)	x
4) Public off-reservation	x	x	69.2 (3)	80.1 (1)	x
	LANGUAGE				
1) Federal on-reservation	110.4 (1)	x	108.7 (2)	111.8 (3)	x
2) Federal off-reservation	109.2 (2)	x	106.0 (4)	108.3 (4)	x
3) Public on-reservation	104.7 (3)	x	106.1 (3)	112.8 (2)	x
4) Public off-reservation	104.0 (4)	x	112.7 (1)	115.8 (1)	x
	TOTAL BATTERY				
1) Federal on-reservation	241.6 (1)	254.8 (1)	232.0 (4)	248.0 (3)	x
2) Federal off-reservation	238.5 (2)	248.4 (2)	235.5 (3)	244.4 (4)	x
3) Public on-reservation	234.6 (3)	247.9 (3)	237.0 (2)	256.6 (2)	x
4) Public off-reservation	230.9 (4)	244.5 (4)	242.6 (1)	257.4 (1)	x

Three-Year and Four-Year Analyses

Achievement by school types was also analyzed for the following three-year and four-year spans of time:

Fall 1966 (pretest) - Spring 1969 (post-test)

Fall 1967 (pretest) - Spring 1970 (post-test)

Fall 1966 (pretest) - Spring 1970 (post-test)

Tables A21 - A25 in Appendix A present the means of criterion and control variables, analysis of covariance and, where appropriate, adjusted criterion means, by school types, for each of the three-year measurement periods and for the four-year period.

A summary of adjusted criterion achievement means of school types for three-year and four-year time spans is presented in Table 6. There were no significant differences in achievement between the four types of schools for the four-year period from the fall of 1966 to the spring of 1970. The three-year analyses yielded significant F scores for 10 of the 16 categories. However, the orders of rank on the 10 significant categories are very mixed and favor the two public school types only slightly, as can be seen by reference to the sums of the ranks in Table 7.

Table 7

Summary of Rankings of School Types Based
Upon Adjusted Criterion Achievement Means

Three-Year Analyses

School Type	1st	2nd	3rd	4th	ΣR
Federal On-Reservation	3	1	2	4	27
Federal Off-Reservation	1	4	2	3	27
Public On-Reservation	2	3	5	0	23
Public Off-Reservation	4	2	1	3	23

Testing the differences in ranks for significance with the Friedman Test yields an X^2 of only 0.96, which falls far short of the figure of 16.9 necessary for significance at the .05 level. Since differences in achievement between the four school types were found to be nonsignificant for 6 categories and the ranks of the school types did not differ significantly on the 10 categories for which significant achievement differences were registered, it appears that academic achievement did not differ significantly between types of schools during the three-year periods.

Summary of Analyses of Academic Achievement by School Types

On the basis of adjusted criterion means, which were calculated for those categories having significant differences, federal schools ranked higher than public schools on one-year analyses, public on-reservation schools ranked highest and federal off-reservation schools lowest by small margins on two-year analyses, and public schools ranked slightly higher than federal schools on three-year analyses. However, rankings of school types were so mixed on those categories for which significant differences were found that differences in ranks were not significant for one-year, two-year, or three-year analyses. No significant differences in achievement between the four types of schools were found for the four-year period.

Altogether, the four types of schools were compared on 104 measures of academic achievement. Of this total of 104 categories of measure, differences in achievement between school types were found to be significant at the .05 level of confidence for only 45 categories. The rankings of the four school types on the 45 significant categories are shown in Table 8, which is a composite of Tables 3, 5, and 7.

Table 8

Total Rankings of School Types Based
Upon Adjusted Criterion Achievement Means

All Time Spans

School Type	1st	2nd	3rd	4th	R
Federal On-Reservation	15	14	6	10	101
Federal Off-Reservation	11	11	12	11	113
Public On -Reservation	10	10	16	9	114
Public Off -Reservation	9	10	11	15	122

Applying the Friedman Test to the data in Table 8 yields an X^2 of 3. With 44 degrees of freedom this falls far short of the X^2 of 60+ necessary for significance at the .05 level.

In summary, significant differences in achievement between types of schools were found for less than one-half of the categories measured and no significant hierarchal pattern of achievement emerged for those categories where significant differences in achievement did exist. The evidence, therefore, does not indicate that the academic achievement of American Indian students was superior or inferior in any particular type of high school when individual differences in scholastic aptitude and academic ability were controlled.

IV. ACADEMIC ACHIEVEMENT BY AREAS

Analyses of academic achievement by geographic areas also were made, similar to the analyses of achievement completed for school types. One-year, two-year, three-year, and four-year analyses were made.

Designated areas correspond to Bureau of Indian Affairs administrative areas and include the following: Aberdeen, Muskogee, Navajo, Phoenix, and Juneau. The numbers of students drawn from each area were based upon the numbers of students from the area enrolled in BIA schools. Therefore, as might be expected, numbers of subjects varied greatly for the different areas.

In testing differences in achievement between areas by analysis of covariance, post-test achievement scores were used as the criterion and pretest achievement and intelligence scores were used as control variables, just as they were in analyzing achievement by school types.

One-Year Analyses

Achievement by areas was analyzed for the following one-year periods:

Fall 1966 (pretest) - Spring 1967 (post-test)
Fall 1967 (pretest) - Spring 1968 (post-test)
Spring 1968 (pretest) - Spring 1969 (post-test)
Spring 1969 (pretest) - Spring 1970 (post-test)

Table 9 presents the means of criterion and control variables, analysis of covariance, and adjusted criterion means, by areas, for ninth grade students who were pretested in the fall of 1966 and post-tested in the spring of 1967. The remaining data for one-year analyses of academic achievement by areas are presented in Tables B1 - B12 in Appendix B.

Table 9

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF NINTH GRADE STUDENTS FALL, 1966-SPRING, 1967, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1. Aberdeen	214	89	56.02	50.63	69.93	63.34	101.53	89.17	227.47	203.14
2. Muskogee	28	81	46.96	41.39	57.07	53.86	91.50	75.21	195.54	170.46
3. Navajo	414	79	45.75	42.28	56.91	55.89	92.28	85.76	194.94	183.93
4. Phoenix	187	81	47.95	43.32	62.07	55.83	95.30	85.61	205.33	184.76
5. Juneau	31	92	62.58	50.97	83.77	68.58	107.06	81.97	253.42	201.52

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	871	77702			140410			125557			547799		
Within Groups	867	75026	86.5		129969	149.9		118171	136.2		490105	565.2	
Difference	4	2676	669	7.73*	10441	2610	17.41*	7386	1846	13.55*	57694	14423	25.52*

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	56.02	-5.02	50.99	69.93	-4.96	64.97	101.53	-3.77	97.76	227.47	-14.19	213.28
2. Muskogee	46.96	+2.29	49.25	57.07	+3.53	60.60	91.50	+7.96	99.46	195.54	+16.00	211.54
3. Navajo	45.75	+2.29	48.04	56.91	+2.12	59.03	92.28	+1.02	93.30	194.94	+5.40	200.34
4. Phoenix	47.95	+1.33	49.28	62.07	+2.00	64.07	95.30	+0.77	96.07	205.33	+4.18	209.51
5. Juneau	62.58	-6.01	56.57	83.77	-9.48	74.29	107.06	+0.56	107.62	253.42	-13.88	239.54

*Significant at the .01 level.

Table 10

ADJUSTED CRITERION ACHIEVEMENT MEANS AND RANKINGS
BY GRADE AND AREA; ONE-YEAR ANALYSES

Area	1966-67				1967-68				1968-69			1969-70	
	9	10	11	12	9	10	11	12	10	11	12	11	12
	READING												
1) Aberdeen	51.0 (2)	55.0 (4)	58.1 (4)	66.7 (3)	x	57.1 (2)	63.8 (1)	82.5 (2)	x	x	x	x	x
2) Muskogee	49.3 (3)	54.4 (5)	59.7 (3)	62.7 (4)	x	54.9 (3)	61.9 (2)	76.2 (5)	x	x	x	x	x
3) Navajo	48.0 (5)	55.2 (3)	57.9 (5)	61.8 (5)	x	54.3 (4)	59.3 (4)	79.4 (3)	x	x	x	x	x
4) Phoenix	49.3 (3)	55.6 (2)	60.1 (2)	67.9 (2)	x	53.5 (5)	59.6 (3)	79.3 (4)	x	x	x	x	x
5) Juneau	56.6 (1)	61.2 (1)	71.3 (1)	73.3 (1)	x	59.4 (1)	57.8 (5)	85.4 (1)	x	x	x	x	x
	MATHEMATICS												
1) Aberdeen	65.0 (2)	68.4 (3)	71.1 (3)	78.9 (3)	x	x	x	82.5 (2)	x	x	75.6 (3)	x	x
2) Muskogee	60.6 (4)	65.9 (5)	66.6 (5)	71.9 (5)	x	x	x	76.2 (5)	x	x	72.3 (5)	x	x
3) Navajo	59.0 (5)	66.8 (4)	71.1 (3)	75.3 (4)	x	x	x	79.4 (3)	x	x	79.1 (1)	x	x
4) Phoenix	64.1 (3)	70.9 (2)	74.8 (2)	79.5 (2)	x	x	x	79.3 (4)	x	x	74.5 (4)	x	x
5) Juneau	74.3 (1)	75.1 (1)	80.7 (1)	85.6 (1)	x	x	x	85.4 (1)	x	x	77.3 (2)	x	x
	LANGUAGE												
1) Aberdeen	97.8 (3)	105.0 (3)	110.7 (2)	117.7 (3)	x	x	110.9 (1)	115.8 (1)	105.3 (2)	113.2 (3)	x	105.1 (5)	108.5 (5)
2) Muskogee	99.5 (2)	104.0 (4)	108.0 (3)	113.0 (4)	x	x	103.7 (5)	106.7 (5)	103.1 (4)	114.3 (2)	x	109.7 (2)	110.7 (4)
3) Navajo	93.3 (5)	102.3 (5)	107.3 (5)	110.9 (5)	x	x	107.5 (3)	115.2 (2)	103.7 (3)	107.3 (5)	x	109.2 (3)	113.8 (1)
4) Phoenix	96.1 (4)	105.1 (2)	107.9 (4)	118.2 (2)	x	x	107.5 (3)	113.0 (4)	100.9 (5)	109.8 (4)	x	108.4 (4)	111.4 (3)
5) Juneau	107.6 (1)	117.1 (1)	123.8 (1)	126.1 (1)	x	x	108.9 (2)	113.4 (3)	114.4 (1)	115.0 (1)	x	111.6 (1)	111.6 (2)
	TOTAL BATTERY												
1) Aberdeen	213.3 (2)	228.8 (3)	239.8 (3)	263.4 (3)	x	234.3 (3)	x	265.6 (1)	227.9 (2)	x	x	234.2 (5)	x
2) Muskogee	211.5 (3)	224.3 (4)	233.6 (5)	245.6 (5)	x	236.0 (1)	x	247.1 (5)	221.9 (4)	x	x	241.5 (2)	x
3) Navajo	200.3 (5)	224.1 (5)	236.3 (4)	248.0 (4)	x	229.0 (4)	x	258.7 (3)	224.8 (3)	x	x	238.8 (3)	x
4) Phoenix	209.5 (4)	231.3 (2)	243.5 (2)	266.4 (2)	x	226.7 (5)	x	254.0 (4)	220.7 (5)	x	x	237.4 (4)	x
5) Juneau	239.5 (1)	254.6 (1)	275.7 (1)	282.8 (1)	x	235.8 (2)	x	259.8 (2)	247.1 (1)	x	x	243.7 (1)	x

( ) Numbers in parentheses indicate rankings.
x No adjusted criterion means or rankings are presented because differences in criterion scores were not significant at the .05 level.

A compilation of the adjusted criterion means gathered from Table 9 and Tables B1 - B12 is presented in Table 10. Rankings by areas are indicated in parentheses, and categories for which significant differences in achievement were not found are marked with the letter x.

A study of Table 10 reveals that achievement differences between the five areas were found to be significant for 31 of the 52 categories. Based upon the adjusted criterion mean scores for the 31 categories for which significant differences were found, the Juneau area ranked first in 24 of 31 categories. A summary of the rankings from Table 10 is presented in Table 11. On the basis of sums of ranks (ΣR), the Juneau area ranked highest by a wide margin (42), Aberdeen ranked second (85), followed in order by Phoenix (102), Navajo (117), and Muskogee (119).

Table 11

Summary of Rankings of Areas Based Upon
Adjusted Criterion Achievement Means

One-Year Analyses

Area	1st	2nd	3rd	4th	5th	ΣR
Aberdeen	4	9	12	3	3	85
Muskogee	1	5	4	9	12	119
Navajo	2	1	10	7	11	117
Phoenix	0	11	4	12	4	102
Juneau	24	5	1	0	1	42

Table 12

ADJUSTED CRITERION ACHIEVEMENT MEANS AND RANKINGS
BY GRADE AND AREA; TWO-YEAR ANALYSES

Area	Fall 1966-Spring 1968			Fall 1967-Spring 1969			Spring 68-Sog 70	
	9-10	10-11	11-12	9-10	10-11	11-12	9-11	10-12
	READING							
1) Aberdeen	57.4 (2)	x	64.3 (2)	54.8 (2)	x	65.0 (3)	56.9 (5)	x
2) Muskogee	54.1 (4)	x	62.0 (5)	52.8 (5)	x	66.4 (1)	59.1 (2)	x
3) Navajo	54.3 (3)	x	62.7 (4)	53.9 (3)	x	62.1 (4)	58.5 (4)	x
4) Phoenix	52.9 (5)	x	63.7 (3)	53.7 (4)	x	61.1 (5)	58.7 (3)	x
5) Juneau	63.3 (1)	x	73.9 (1)	58.2 (1)	x	66.0 (2)	64.3 (1)	x
	MATHEMATICS							
1) Aberdeen	73.2 (2)	73.9 (4)	78.2 (4)	63.8 (4)	x	74.3 (3)	69.5 (4)	76.9 (3)
2) Muskogee	73.3 (2)	68.5 (5)	71.2 (5)	58.4 (5)	x	67.4 (5)	70.1 (3)	74.2 (4)
3) Navajo	72.1 (4)	76.2 (3)	81.8 (3)	64.9 (2)	x	76.3 (1)	73.3 (1)	80.0 (2)
4) Phoenix	71.3 (5)	79.1 (2)	82.8 (2)	64.3 (3)	x	72.6 (4)	71.4 (2)	81.4 (1)
5) Juneau	87.2 (1)	81.6 (1)	88.5 (1)	65.1 (1)	x	74.6 (2)	68.9 (5)	72.8 (5)
	LANGUAGE							
1) Aberdeen	107.0 (2)	110.6 (2)	113.6 (3)	105.1 (2)	111.1 (3)	x	106.0 (5)	x
2) Muskogee	102.7 (3)	103.7 (5)	106.9 (5)	96.5 (5)	111.4 (2)	x	109.9 (2)	x
3) Navajo	101.6 (4)	107.6 (4)	114.3 (2)	102.7 (3)	106.1 (5)	x	109.6 (3)	x
4) Phoenix	97.4 (5)	108.7 (3)	112.5 (4)	99.9 (4)	106.5 (4)	x	108.7 (4)	x
5) Juneau	114.1 (1)	123.7 (1)	125.9 (1)	107.5 (1)	114.2 (1)	x	112.1 (1)	x
	TOTAL BATTERY							
1) Aberdeen	233.2 (2)	247.0 (2)	256.3 (4)	223.7 (2)	x	254.3 (1)	231.9 (5)	252.8 (3)
2) Muskogee	232.2 (3)	232.7 (5)	240.2 (5)	207.1 (5)	x	244.5 (5)	239.6 (3)	245.4 (4)
3) Navajo	229.7 (4)	242.8 (4)	258.6 (3)	221.8 (3)	x	252.1 (3)	241.7 (2)	255.1 (2)
4) Phoenix	222.9 (5)	246.8 (3)	259.4 (2)	218.2 (4)	x	244.7 (4)	239.5 (4)	260.7 (1)
5) Juneau	268.5 (1)	268.5 (1)	287.7 (1)	229.4 (1)	x	253.3 (2)	242.3 (1)	244.7 (5)

( ) Numbers in parentheses indicate rankings.

x No adjusted means or rankings are presented because differences in criterion scores were not significant at the .05 level.

Using the Friedman Formula to test differences in ranks for significance yields an X^2 value of 50.42. With 30 degrees of freedom, 50.42 is significant at the .05 level, indicating that achievement differed significantly between areas on one-year analyses.

Two-Year Analyses

Achievement by areas was analysed for the following two-year periods:

Fall 1966 (pretest) - Spring 1968 (post-test)
Fall 1967 (pretest) - Spring 1969 (post-test)
Spring 1968 (pretest) - Spring 1970 (post-test)

Tables B13 - B20 in Appendix B present the means of criterion and control variables, analysis of covariance, and, where appropriate, adjusted criterion means, by areas, for each of the two-year measurement periods.

A summary of adjusted criterion achievement means by areas for two-year intervals is presented in Table 12. An inspection of the table reveals that differences in achievement between areas were found to be significant for 25 of the 32 categories, while for only 7 categories were differences found nonsignificant. Again, as was true for the one-year analyses, the Juneau area ranked first by a large margin, followed by Aberdeen. Next in order were Navajo, Phoenix, and Muskogee.

A summary of the rankings from Table 12 appears in Table 13. On the basis of sums of ranks (ΣR), the Juneau area ranked highest (40), Aberdeen and Navajo were second (75 and 76), followed by Phoenix (86) and Muskogee (98).

Table 13

Summary of Rankings of Areas Based
Upon Adjusted Criterion Achievement Means

Two-Year Analyses

Area	1st	2nd	3rd	4th	5th	ΣR
Aberdeen	1	9	7	5	3	75
Muskogee	1	4	4	3	13	98
Navajo	2	5	9	8	1	76
Phoenix	2	4	5	9	5	86
Juneau	19	3	0	0	3	40

Application of the Friedman Test for differences in ranks yields an X^2 value of 30.01, which is not significant at the .05 level with 24 degrees of freedom. Thus, analyses indicate that achievement did not differ significantly between areas for the two-year measurement periods.

Three-Year and Four-Year Analyses

Analysis of achievement by areas was also analyzed for the following three-year and four-year spans of time:

Fall 1966 (pretest) - Spring 1969 (post-test)

Fall 1967 (pretest) - Spring 1970 (post-test)

Fall 1966 (pretest) - Spring 1970 (post-test)

Tables B21 - B25 in Appendix B present the means of criterion and control variables, analysis of covariance and, where appropriate, adjusted criterion means, by areas, for each of the three-year time spans and for the four-year period.

A summary of adjusted criterion means by areas for three-year and four-year time spans are presented in Table 14. Differences in achievement for the areas were significant for 11 of the 16 three-year categories

Table 14

ADJUSTED CRITERION ACHIEVEMENT MEANS AND RANKINGS
BY GRADE AND AREA
THREE AND FOUR YEAR ANALYSES

	Three Year Analysis				Four Year
	Fall 1966-Spring 1969		Fall 1967-Spring 1970		Fall 66-Spr. 70
Area	9th-11th	10th-12th	9th-11th	10th-12th	9th-12th
	READING				
1) Aberdeen	59.9 (3)	64.3 (3)	58.1 (3)	x	65.9 (2)
2) Muskogee	61.3 (2)	66.4 (2)	58.7 (2)	x	62.0 (3)
3) Navajo	56.8 (5)	61.8 (4)	57.7 (4)	x	60.2 (5)
4) Phoenix	57.6 (4)	61.7 (5)	56.8 (5)	x	60.7 (4)
5) Juneau	67.4 (1)	71.7 (1)	65.0 (1)	x	68.4 (1)
	MATHEMATICS				
1) Aberdeen	68.8 (4)	69.9 (4)	x	x	75.6 (4)
2) Muskogee	68.5 (5)	63.6 (5)	x	x	71.8 (5)
3) Navajo	72.0 (2)	75.7 (2)	x	x	78.0 (2)
4) Phoenix	70.0 (3)	75.0 (3)	x	x	77.0 (3)
5) Juneau	80.8 (1)	78.0 (1)	x	x	84.5 (1)
	LANGUAGE				
1) Aberdeen	109.9 (3)	115.2 (2)	107.2 (3)	x	111.1 (3)
2) Muskogee	113.9 (2)	109.7 (5)	101.8 (5)	x	116.2 (2)
3) Navajo	104.8 (5)	110.7 (4)	108.5 (2)	x	109.5 (5)
4) Phoenix	105.1 (4)	112.4 (3)	106.8 (4)	x	110.1 (4)
5) Juneau	125.7 (1)	126.8 (1)	113.7 (1)	x	125.2 (1)
	TOTAL BATTERY				
1) Aberdeen	238.6 (3)	249.6 (2)	233.7 (4)	x	252.9 (2)
2) Muskogee	244.2 (2)	240.5 (5)	226.9 (5)	x	250.8 (3)
3) Navajo	233.3 (4)	248.3 (4)	237.6 (2)	x	247.2 (5)
4) Phoenix	232.8 (5)	248.6 (3)	234.5 (3)	x	247.6 (4)
5) Juneau	276.5 (1)	276.5 (1)	249.7 (1)	x	281.8 (1)

( ) Numbers in parentheses indicate rankings.
x No adjusted means or rankings presented because differences in criterion scores were not significant at the .05 level.

and for all 4 of the four-year categories. Juneau ranked first in every three-year category, and was followed in order in overall rankings by Aberdeen, Navajo, Muskogee, and Phoenix.

A summary of rankings from Table 14 for three-year analyses is presented in Table 15. On the basis of sums of ranks the order of rank from highest achievement to lowest is: Juneau, Aberdeen, Navajo, Muskogee, and Phoenix.

Table 15

Summary of Rankings of Areas Based
Upon Adjusted Criterion Achievement Means

Three-Year Analyses

Area	1st	2nd	3rd	4th	5th	ΣR
Aberdeen	0	2	6	3	0	34
Muskogee	0	5	0	0	6	40
Navajo	0	4	0	5	2	38
Phoenix	0	0	5	3	3	42
Juneau	11	0	0	0	0	11

The Friedman Test yields an X^2 of 23.27, which is significant at the .01 level with 10 degrees of freedom, indicating that differences in achievement between areas were significant for the three-year measurement periods.

A summary of rankings from Table 14 for the four-year analyses is shown in Table 16. On the basis of sums of ranks it can be seen that achievement was highest in the Juneau area, followed in order by Aberdeen, Muskogee, Phoenix, and Navajo.

Table 16

Summary of Rankings of Areas Based
Upon Adjusted Criterion Achievement Means

Four-Year Analyses

Area	1st	2nd	3rd	4th	5th	ΣR
Aberdeen	0	2	1	1	0	11
Muskogee	0	1	2	0	1	13
Navajo	0	1	0	0	3	17
Phoenix	0	0	1	3	0	15
Juneau	4	0	0	0	0	4

Computation of X^2 by the Friedman Formula gives a value of 10, which is significant at the .05 level. Achievement of Indian students in the five areas seemed to differ significantly over the four-year measurement period.

Summary of Analyses of Academic Achievement by Areas

Based upon adjusted criterion means, the Juneau area ranked first and the Aberdeen area second for every time span. Rankings for the three other areas varied for the different measurement periods.

Of the total of 104 categories on which achievement was measured, differences in achievement between areas were found to be significant at or beyond the 5% level of confidence for 71, or more than two-thirds, of the categories. Rankings based upon all 71 categories are presented in Table 17, which is a composite of Tables 11, 13, 15, and 16.

Table 17

Total Rankings of Areas Based Upon
Adjusted Criterion Achievement Means

All Time Spans

Area	1st	2nd	3rd	4th	5th	ΣR
Aberdeen	5	22	26	12	6	205
Muskogee	2	15	10	12	32	270
Navajo	4	11	19	20	17	248
Phoenix	2	15	15	27	12	245
Juneau	58	8	1	0	4	97

Applying the Friedman Test to the data in Table 17 yields an X^2 of 107.14. With 70 degrees of freedom this value is significant at the .01 level of confidence.

In summary, when individual differences in scholastic aptitude and academic ability were controlled, differences in achievement between areas appeared to be significant, with the Juneau area ranking highest, followed by Aberdeen. No clear pattern of superiority emerged for the other three areas.

V. ACADEMIC ACHIEVEMENT BY GRADE AND SEX

Academic Achievement by Grades

Academic achievement data for each grade are presented in Table 18. While it is evident that academic achievement of Indian students, as measured by the California Achievement Test, is progressive from grade 9 through grade 12, it is also evident that achievement is regressive when compared to national norms. For example, the difference in grade placement in reading for students at the actual 9.1 grade level and those at the 12.8 grade level was 2 grades rather than the 3.7 grades considered normal. For mathematics the grade placement differences were even smaller, registering 1.3 grades for the 1966-67 school year and 1.9 grades for the 1967-68 school year. Language showed somewhat greater differences, with 2.5 grades for 1966-67 and 2 grades for 1967-68. In comparing actual grade placement with achievement grade placement as measured by the California Achievement Total Battery mean scores, it is seen that Indian students were about one year retarded academically when entering ninth grade but were more than two and one-half years retarded when about to graduate from high school.

Percentile rankings demonstrate this progressive retardation very strikingly. Based upon total battery mean scores, ninth grade students ranked at percentile 27, while twelfth grade students ranked at percentile 14. Similar regression occurred for each of the separate subject areas. Scores were consistently highest in language and lowest in mathematics.

Table 18

ACADEMIC ACHIEVEMENT BY GRADE
CALIFORNIA ACHIEVEMENT TEST BATTERY

Actual Grade Placement	School Year 1966-67			School Year 1967-68			Spring, 1969			Spring, 1970		
	Mean Raw Score	Grade Placement	Percentile	Mean Raw Score	Grade Placement	Percentile	Mean Raw Score	Grade Placement	Percentile	Mean Raw Score	Grade Placement	Percentile
READING												
9.1	44.8	8.0	34	44.5	8.0	34						
9.8	49.4	8.4	27	47.7	8.3	27						
10.1	50.1	8.5	27	51.7	8.7	27						
10.8	55.4	9.0	21	55.2	9.0	21	55.6	9.1	24			
11.1	54.6	9.0	18	57.4	9.2	21						
11.8	58.9	9.4	16	60.6	9.6	18	60.9	9.6	18	58.6	9.4	16
12.1	60.7	9.6	14	61.0	9.6	14						
12.8	64.6	10.0	12	64.1	9.9	12	64.6	10.0	12	62.3	9.7	10
MATHEMATICS												
9.1	58.1	7.5	18	56.2	7.3	16						
9.8	62.2	7.7	18	65.5	7.9	21						
10.1	66.2	7.9	21	69.5	8.2	24						
10.8	68.3	8.1	16	73.0	8.4	21	66.5	8.0	16			
11.1	70.0	8.2	16	73.0	8.4	18						
11.8	71.9	8.3	14	76.3	8.7	16	74.8	8.6	16	71.3	8.2	12
12.1	74.0	8.5	12	77.3	8.8	16						
12.8	77.2	8.8	12	80.5	9.2	14	76.6	8.8	12	77.8	8.9	12
LANGUAGE												
9.1	86.1	8.4	38	90.4	8.8	46						
9.8	95.7	9.3	42	94.8	9.2	38						
10.1	94.0	9.2	30	101.2	9.8	42						
10.8	104.2	10.0	34	102.3	9.8	30	104.5	10.1	34			
11.1	99.8	9.7	24	106.7	10.2	30						
11.8	108.9	10.4	27	108.3	10.3	24	110.0	10.5	27	108.5	10.4	24
12.1	105.8	10.2	18	112.6	10.7	27						
12.8	114.6	10.9	24	114.2	10.8	21	114.6	10.9	24	112.1	10.7	18
TOTAL BATTERY												
9.1	189.0	8.0	27	191.1	8.0	27						
9.8	207.2	8.5	27	208.0	8.5	27						
10.1	210.3	8.6	24	222.4	8.9	30						
10.8	228.0	9.1	24	230.5	9.2	24	226.5	9.1	24			
11.1	224.4	9.0	18	237.1	9.4	24						
11.8	239.7	9.5	18	245.2	9.7	18	245.7	9.7	21	238.3	9.5	16
12.1	240.6	9.5	14	250.8	9.9	16						
12.8	256.4	10.1	14	258.8	10.2	14	255.8	10.1	14	252.1	9.9	12

Table 19

MEAN RAW SCORES BY SEX AND GRADE
CALIFORNIA ACHIEVEMENT BATTERY

Grade	Sex	Fall 1966	Spring 1967	Fall 1967	Spring 1968	Spring 1969	Spring 1970
READING							
9th Grade	Male	46.1	49.9	45.7	49.1		
	Female	43.7	48.9	43.3	46.4		
10th Grade	Male	51.0	56.4	52.6	55.4	57.5	
	Female	49.3	54.4	50.8	55.1	54.8	
11th Grade	Male	56.2	60.4	58.2	62.0	59.7	60.5
	Female	53.0	57.4	56.8	59.3	59.0	56.9
12th Grade	Male	62.8	65.5	61.9	65.0	63.9	63.3
	Female	58.9	63.7	60.2	63.4	65.2	61.1
MATHEMATICS							
9th Grade	Male	59.1	63.7	57.6	69.0		
	Female	57.2	60.8	54.8	62.3		
10th Grade	Male	68.7	71.3	70.6	74.6	69.4	
	Female	63.8	65.5	68.5	71.4	64.7	
11th Grade	Male	74.4	77.4	77.4	80.0	74.1	74.9
	Female	65.7	66.5	68.7	72.7	72.1	67.9
12th Grade	Male	78.0	81.3	81.7	85.2	80.0	78.5
	Female	70.4	73.5	73.3	76.2	73.7	77.0
LANGUAGE							
9th Grade	Male	82.2	91.9	87.5	92.6		
	Female	89.5	99.1	93.1	97.0		
10th Grade	Male	90.8	101.1	97.1	98.1	100.8	
	Female	97.1	107.3	105.3	106.5	107.1	
11th Grade	Male	97.8	107.2	104.8	105.8	106.0	104.9
	Female	101.7	110.6	108.6	110.7	111.5	111.7
12th Grade	Male	102.4	111.4	108.1	108.6	110.4	107.8
	Female	109.0	117.5	116.6	119.2	118.1	116.7

Academic Achievement by Sex

When achievement scores are compared by sex, it can be seen from an inspection of Table 19 that boys consistently scored slightly higher than girls in reading and considerably higher than girls in mathematics, while girls consistently scored substantially higher than boys in language. Attesting to the consistency of the above achievement pattern is the fact that the only exception to the pattern in the 63 comparisons presented in Table 19 was for 12th grade reading in the spring of 1969 testing.

The evidence clearly indicates superiority of Indian boys over girls in the mastery of reading and mathematics skills and the superiority of girls over boys in the mastery of English language skills.

VI. RESPONSES TO OTHER MEASUREMENT INSTRUMENTS

Responses to Questionnaire

Each student was asked to respond to a questionnaire as a means of obtaining personal and familial data. Total affirmative responses to each question are presented in percentage form for each school type in Table 20, and for each area in Table 21.

Student responses to the questionnaire, as presented in Table 20, indicate that higher percentages of public high school than federal high school students have telephones, TV sets, and daily newspapers in the home. Also, more started school at six years of age or younger, more of their parents are high school graduates, more of their parents are regularly employed, and fewer students know how to take part in tribal ceremonies.

Public off-reservation schools had the highest percentage in whose homes English is the primary language, as well as the highest percentage who spoke English when they started school. Public on-reservation schools had the highest percentage of students residing on a reservation.

When questionnaire responses are tabulated by areas, as presented in Table 21, certain differences and similarities between areas become evident. Some of these that seem most apparent are:

1. A majority of Indian high school students in the Aberdeen (75%), Navajo (80%), and Phoenix (90%) areas live on reservations, while very few in the Muskogee (5%) and Juneau (5%) areas do.
2. Only 1% of the students tested in the Juneau area claimed to have a TV set at home, while substantial numbers

Table 20
Affirmative Responses of Students to Questionnaire Items In Percentages by School Type

Item	Type 1 Federal on-reservation	Type 2 Federal off-reservation	Type 3 Public on-reservation	Type 4 Public off-reservation
1. Student lives on a reservation	76	59	94	70
2. Family has lived off-reservation at some time	49	48	32	49
3. Father is regularly employed	51	39	52	55
4. Mother is regularly employed	20	13	27	23
5. Student gave a home telephone number	10	8	17	22
6. Family has a TV set in home	44	46	65	78
7. Parents read a newspaper every day	32	34	46	46
8. Father is a high school graduate	10	11	19	20
9. Mother is a high school graduate	9	8	15	20
10. English is the language of the home	22	36	32	43
11. Student spoke English when started school	61	77	67	80
12. Student is a full-blood Indian	74	68	76	75
13. At some time dropped out of school for 1/2 year	15	21	8	7
14. Knows how to take part in tribal ceremonies	40	44	33	28
15. Started school at 6 or younger	78	75	87	85
16. Attended public school for at least 6 months	51	57	88	92
17. Attended mission school for at least 6 months	16	21	28	16
18. Father is living	82	85	89	85
19. Mother is living	90	88	96	93
20. Parents are divorced	13	14	12	12
21. Parents are separated	14	20	14	17
22. Family receives some welfare assistance	19	23	14	18
Total Number Respondents	633	714	717	519

Table 21
Affirmative Responses of Students to Questionnaire Items
In Percentages by Areas

Item	1. Aberdeen	2. Muskogee	3. Navajo	4. Phoenix	5. Juneau
1. Student lives on a reservation	75	5	80	90	5
2. Family has lived off-reservation at some time	60	51	38	43	22
3. Father is regularly employed	50	37	47	54	44
4. Mother is regularly employed	27	24	20	18	8
5. Student gave a home telephone number	18	19	11	17	9
6. Family has a TV set in home	80	87	48	57	1
7. Parents read a newspaper every day	53	44	33	40	24
8. Father is a high school graduate	25	16	11	15	5
9. Mother is a high school graduate	25	20	7	13	4
10. English is the language of the home	66	57	16	30	37
11. Student spoke English when started school	92	88	56	73	87
12. Student is a full-blood Indian	36	57	91	86	35
13. At some time dropped out of school for 1/2 year	13	4	15	12	13
14. Knows how to take part in tribal ceremonies	38	34	37	37	31
15. Started school at 6 or younger	82	78	78	86	88
16. Attended public school for at least 6 months	71	84	71	73	46
17. Attended mission school for at least 6 months	36	14	16	17	3
18. Father is living	86	76	85	89	91
19. Mother is living	88	92	92	94	86
20. Parents are divorced	16	22	11	12	7
21. Parents are separated	24	31	13	15	7
22. Family receives some welfare assistance	22	33	16	17	15
Total Number Respondents	614	107	1246	515	101

in other areas, ranging from 48 percent in the Navajo to 87 percent in the Muskogee areas, claimed them.

3. The Juneau and Navajo areas ranked lower than other areas in telephones, daily newspapers, parents who graduated from high school, parents divorced or separated, and families receiving welfare assistance.
4. The Navajo area has much the lowest percentage of homes in which English was the primary language (16%), and in percentage of students who spoke English when they started school (56%), while Aberdeen was highest in both categories (66%, 92%).
5. The Navajo area had the highest percentage who had dropped out of school for 1/2 year or more (15%), and the Muskogee area the lowest (4%).
6. The Navajo area ranked highest in percent of full-blood Indian students with 91 percent, followed closely by the Phoenix area at 86 percent.
7. The Muskogee area had the lowest percentage of fathers regularly employed (37%) and Phoenix the highest (54%), while the Juneau area had the lowest percentage of employed mothers (8%) and the Aberdeen area the highest (27%).
8. Knowledge of how to take part in tribal ceremonies seems to differ little from one area to another, ranging only from a low of 31 percent in the Juneau area to a high of 38 percent in the Aberdeen area.

Questionnaire responses by grade were also tabulated but are not presented because of the similarity of responses from grade to grade. For the same reason, it did not seem profitable to present responses by sex.

Responses to Mooney Problem Check List

Tables 22-25 present responses of students to the abbreviated version of the Mooney Problem Check List administered in this study. Students were asked to check each item that they felt described a problem for them. Figures in the tables are percentages of all students in each category who checked the particular item.

Table 22

Mooney Problem Check List Responses
In Percentages By Sex

	Response Items	Male Percent	Female Percent
1.	Don't get enough sleep	37	39
2.	Being a grade behind in school	24	23
3.	Being an only child	2	2
4.	Having to ask parents for money	38	54
5.	Not allowed to run with kids I like	13	25

Table 22 (Continued)

	Response Items	Male Percent	Female Percent
6.	Bashful	30	34
7.	Getting too excited	18	26
8.	Poor complexion or skin trouble	22	35
9.	Trouble with writing	29	28
10.	Death in the family	11	19
11.	Not knowing how to buy things wisely	25	29
12.	Girls don't seem to like me	15	7
13.	Too easily led by other people	16	16
14.	Lacking self-control	15	19
15.	Underweight	13	9
16.	Worried about grades	58	73
17.	Parents favoring a brother or sister	9	15
18.	Needing to find a part-time job now	42	43
19.	Wanting to know more about boys	3	11
20.	Being treated like an outsider	7	8
21.	Not having as much fun as other kids	12	21
22.	Afraid I need an operation	4	6
23.	School is too strict	29	21
24.	Parents not liking my friends	11	20
25.	Deciding what to take in high school	37	49
26.	Ill at ease at social affairs	12	18
27.	Awkward in meeting people	23	30
28.	Being careless	18	23
29.	Smoking	20	14
30.	Trouble with oral reports	43	51
31.	Needing to know my vocational abilities	33	41
32.	Deciding whether to go steady	9	12
33.	Being stubborn	8	16
34.	Afraid God is going to punish me	14	20
35.	Trouble with my feet	6	3
36.	Not interested in certain subjects	38	50
37.	Mother	3	8
38.	Not knowing what I really want	34	49
39.	Thinking too much about the opposite sex	9	10
40.	Being jealous	5	14
41.	Sometimes lying without meaning to	32	40

Table 23
Mooney Problem Check List Responses
In Percentages For Each Sex
By Areas

	Response Items	Aberdeen		Muskogee		Navajo		Phoenix		Juneau	
		M	F	M	F	M	F	M	F	M	F
1.	Sleep	33	38	44	40	39	41	38	36	22	27
2.	Grade Behind	21	16	15	9	27	30	25	20	4	18
3.	Only Child	2	2	2	2	2	3	2	3	2	2
4.	Money	34	40	44	60	37	59	41	53	48	68
5.	Not allowed to run with kids I like	10	22	6	15	18	30	11	24	2	7
6.	Bashful	25	30	25	40	35	36	29	36	26	30
7.	Excited	13	17	8	13	22	33	19	27	4	25
8.	Complexion	24	31	14	42	23	38	23	37	20	25
9.	Writing	23	21	33	34	32	33	29	27	26	14
10.	Death	11	14	14	13	13	23	8	18	17	29
11.	Buying	21	26	10	45	26	30	28	28	35	32
12.	Girls don't seem to like me	13	8	10	8	17	7	15	8	11	4
13.	Easily led	16	21	14	21	18	15	11	11	15	23
14.	Self-Control	13	15	17	23	16	23	15	17	11	14
15.	Underweight	12	11	17	17	15	10	9	5	9	2
16.	Grades	52	60	48	59	59	79	67	76	39	84
17.	Parental Favoritism	9	19	10	13	10	16	6	11	15	9
18.	Part-time Job	32	26	40	59	50	52	38	37	52	46
19.	Wanting to know more about boys	1	13	2	19	5	10	1	10	2	18
20.	Being treated like an outsider	5	9	2	13	9	7	6	9	2	9
21.	No fun	10	17	15	23	14	24	14	24	4	5
22.	Operation	2	4	2	19	6	8	2	5	4	18
23.	Strict School	20	20	6	36	36	22	29	21	33	9
24.	Parents not liking my friends	9	26	8	19	12	19	11	15	4	7
25.	Deciding Courses	26	34	21	25	44	58	43	51	22	45
26.	Ill at ease at social affairs	13	20	10	23	12	18	10	16	13	23
27.	Awkward meeting people	24	30	21	34	26	30	16	27	22	39
28.	Careless	14	17	8	15	21	26	21	25	13	20
29.	Smoking	22	31	15	11	18	6	19	4	46	39
30.	Oral Reports	36	42	48	66	48	54	43	56	37	50

Table 23 (Continued)

Response Items		Aberdeen		Muskogee		Navajo		Phoenix		Juneau	
		M	F	M	F	M	F	M	F	M	F
31.	Knowing my vocational abilities	28	31	27	30	37	46	31	39	54	52
32.	Going Steady	11	12	4	19	9	12	7	10	26	14
33.	Stubborn	6	19	10	28	11	15	8	12	2	9
34.	Divine Punishment	6	9	4	15	23	28	9	20	4	7
35.	Feet	3	2	2	19	9	4	3	3	9	4
36.	Certain Subjects	18	41	25	57	39	53	44	53	44	63
37.	Mother	3	9	4	11	3	9	2	4	22	13
38.	Not knowing what I really want	24	40	27	76	41	53	33	44	28	52
39.	Opposite Sex	10	13	12	11	7	9	9	9	13	13
40.	Jealous	4	12	19	19	7	13	4	16	11	11
41.	Lying	22	31	48	45	36	46	33	41	33	38

Table 24
Mooney Problem Check List Responses
In Percentages for Each Sex
By School Type

Response Items		Federal on-reservation		Federal off-reservation		Public on-reservation		Public off-reservation	
		M	F	M	F	M	F	M	F
1.	Sleep	39	49	44	47	34	31	29	26
2.	Grade Behind	28	27	23	28	23	23	20	12
3.	Only Child	3	3	1	2	2	3	3	2
4.	Money	34	55	36	50	45	55	33	54
5.	Not allowed to run with kids I like	16	30	6	17	18	25	12	31
6.	Bashful	33	33	30	42	30	28	30	35
7.	Excited	23	32	14	29	19	22	15	24
8.	Complexion	25	38	21	35	23	38	20	27
9.	Writing	34	31	32	31	29	27	19	21
10.	Death	12	19	12	22	12	19	7	17
11.	Buying	30	32	26	34	26	25	15	26

Table 24 (Continued)

	Response Items	Federal on-reservation		Federal off-reservation		Public on-reservation		Public off-reservation	
		M	F	M	F	M	F	M	F
12.	Girls don't seem to like me	17	8	11	5	15	7	17	8
13.	Easily led	18	15	12	19	19	16	12	14
14.	Self-Control	16	27	16	17	15	15	13	19
15.	Underweight	15	13	12	7	13	8	12	11
16.	Grades	60	82	53	75	60	67	57	70
17.	Parental Favoritism	9	14	7	15	8	17	12	15
18.	Part-time Job	48	50	43	41	41	39	34	41
19.	Wanting to know more about boys	6	6	2	13	2	14	2	11
20.	Being treated like an outsider	8	6	5	10	8	8	7	9
21.	No fun	12	20	8	17	15	26	14	21
22.	Operation	7	8	3	5	3	6	2	4
23.	Strict School	31	19	27	28	32	22	22	14
24.	Parents not liking my friends	9	19	5	15	16	21	12	26
25.	Deciding Courses	46	57	34	53	35	42	36	42
26.	Ill at ease at social affairs	19	23	8	19	9	15	12	16
27.	Awkward meeting people	33	32	18	34	21	25	21	29
28.	Careless	20	22	16	24	21	22	15	21
29.	Smoking	21	20	24	19	17	8	18	8
30.	Oral Reports	49	52	35	49	44	49	45	56
31.	Knowing my vocational abilities	48	52	34	49	26	29	27	32
32.	Going Steady	11	10	9	14	9	13	8	10
33.	Stubborn	9	20	7	18	10	13	7	12
34.	Divine Punishment	28	31	9	22	8	13	13	16
35.	Feet	10	3	3	4	6	3	5	2
36.	Certain Subjects	37	56	39	54	38	43	36	49
37.	Mother	4	8	1	8	2	8	5	9
38.	Not knowing what I really want	33	51	35	57	35	43	30	44
39.	Opposite Sex	8	8	7	10	10	11	10	12
40.	Jealous	7	11	3	13	5	14	7	18
41.	Lying	32	43	32	40	31	36	33	44

Table 25
Mooney Problem Check List Responses
In Percentages For Each Sex
By Grades

	Response Items	Ninth		Tenth		Eleventh		Twelfth	
		M	F	M	F	M	F	M	F
1.	Sleep	36	33	34	39	35	41	43	47
2.	Grade Behind	26	25	21	23	30	22	17	21
3.	Only Child	4	3	1	2	2	3	3	2
4.	Money	32	51	40	59	40	56	42	47
5.	Not allowed to run with kids I like	13	26	13	24	13	23	14	28
6.	Bashful	27	36	33	34	31	34	32	32
7.	Excited	19	31	19	23	16	28	17	22
8.	Complexion	20	33	20	37	28	34	25	36
9.	Writing	31	31	25	28	30	26	29	25
10.	Death	12	24	11	18	11	14	11	19
11.	Buying	19	25	24	28	28	31	32	39
12.	Girls don't seem to like me	14	7	14	8	14	8	18	4
13.	Easily led	14	16	16	12	14	24	21	15
14.	Self-Control	12	17	12	22	16	20	24	19
15.	Underweight	12	11	12	7	15	8	14	11
16.	Grades	59	73	57	71	57	72	57	76
17.	Parental Favoritism	12	19	9	15	4	15	7	11
18.	Part-time Job	36	37	43	43	43	47	48	49
19.	Wanting to know more about boys	3	12	3	10	3	15	2	8
20.	Being treated like an outsider	8	11	4	7	6	8	10	6
21.	No fun	12	22	12	21	16	22	10	19
22.	Operation	4	5	4	7	3	6	3	5
23.	Strict School	21	20	32	20	24	25	43	21
24.	Parents not liking my friends	11	20	9	17	9	20	14	23
25.	Deciding Courses	43	57	44	54	35	49	20	25
26.	Ill at ease at social affairs	9	15	10	17	12	20	20	26
27.	Awkward meeting people	18	25	21	31	31	31	26	37
28.	Careless	21	27	13	20	23	20	18	21
29.	Smoking	19	13	20	15	18	13	23	14
30.	Oral Reports	42	50	43	53	43	48	46	56

Table 25 (Continued)

	Response Items	Ninth		Tenth		Eleventh		Twelfth	
		M	F	M	F	M	F	M	F
31.	Knowing my vocational abilities	23	30	34	39	40	47	45	55
32.	Going Steady	10	11	9	12	9	18	10	9
33.	Stubborn	8	12	7	16	9	16	11	21
34.	Divine Punishment	11	22	11	15	20	21	16	23
35.	Feet	5	5	7	2	7	3	3	2
36.	Certain Subjects	36	49	35	47	39	57	42	51
37.	Mother	3	9	2	9	4	6	1	7
38.	Not knowing what I really want	32	44	31	43	35	57	39	57
39.	Opposite Sex	7	11	8	10	9	12	12	7
40.	Jealous	2	13	5	12	7	16	8	15
41.	Lying	29	39	30	39	37	40	34	45

Table 22 reveals that more Indian high school students of both sexes were concerned about grades than about any other problem listed. This item, number 16, was checked most frequently, both by boys (58%) and by girls (73%). It is interesting to note that the sexes agreed on the ten problems which troubled them most, although not always in the same order of rank. The other items ranking in the top ten, in order of total frequency checked, are: (30) oral reports, (4) having to ask parents for money, (36) not interested in certain subjects, (25) deciding what to take in high school, (18) needing to find a part time job now, (38) not knowing what I really want, (1) not getting enough sleep, (31) needing to know my vocational abilities, and (41) lying without meaning to.

Other items which ranked high in frequency of responses for both sexes were: (6) bashful, (9) trouble with writing, (11) not knowing how to buy things wisely, and (27) awkward in meeting people.

Girls also checked frequently: (8) poor complexion or skin trouble, and (7) getting too excited. Apparently girls felt that they had more problems than did boys, since 32 of the 41 items were checked by a higher percentage of girls than boys. However, the following problems seemed to concern more boys than girls: (23) school too strict, (29) smoking, (12) girls don't seem to like me, and (15) underweight.

Those problems checked least frequently were: (3) being an only child, (35) trouble with my feet, (22) afraid I may need an operation, (37) Mother, (19) wanting to know more about boys, and (2) being treated like an outsider.

The following are some observations based upon inspection of Table 23:

1. In the Juneau area, parents not liking students' friends (24), and not being allowed to run with certain friends (5) are not as frequent problems as for students of other areas.
2. A higher percentage of Juneau area students found smoking (29) and needing to know their vocational abilities (31) to be causes for concern than did students of other areas.

2 OF 3

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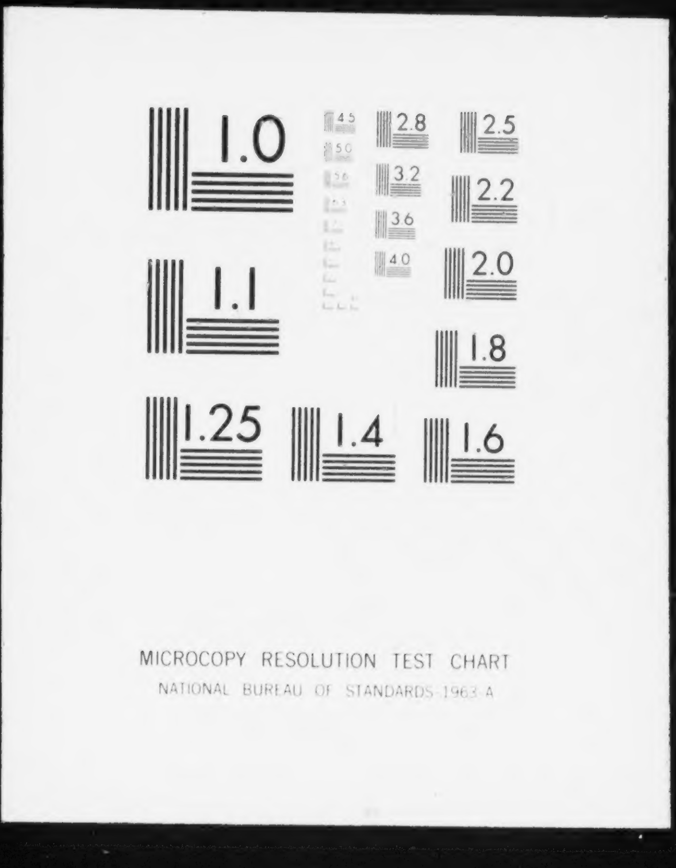

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

3. Higher percentages of students in the Navajo area, with Phoenix running a close second, checked the following items: (2) being a grade behind in school, (7) getting too excited, (25) deciding what to take in high school, and (34) afraid God is going to punish me.

In making comparisons of Mooney data between school types it can be seen in Table 24 that higher percentages of students in federal schools than in public schools considered the following items to be problems: (1) don't get enough sleep, (2) being a grade behind in school, (9) trouble with writing, (25) deciding what to take in high school, (29) smoking, (32) needing to know my vocational abilities, and (38) not knowing what I really want. It is interesting that students in federal on-reservation schools checked about twice as frequently as other students item 34, "afraid that God is going to punish me." They also checked item 22 more frequently, "afraid I may need an operation."

Public school off-reservation students checked less frequently than others item 23, "school is too strict."

In examining Mooney data by grades there are a number of problems that seem to become increasingly critical as students progress from grade 9 through grade 12. As can be seen from inspection of Table 25 these problems are: (1) don't get enough sleep, (11) not knowing how to buy things wisely, (18) needing to find a part-time job now, (26) ill at ease at social affairs, (27) awkward in meeting people, (31) needing to know my vocational abilities, and (38) not knowing what I really want. Other problems seem to remain at a relatively consistent level, with one rather interesting and striking exception being the relatively high percentage of twelfth grade males who considered item 23, "school is too strict," a problem.

It is possible to analyze the Mooney Problem Check List responses by problem areas, as well as by individual responses. Items may be grouped together into seven problem areas. When total responses made to all items in a problem area are figured as percentages of total possible responses for all items in that problem area and this is done for each of the seven areas, it is possible to see the areas of greatest concern. The general problem areas, with percentages of items that were checked for each problem area, are as follows:

I.	Health and Physical Development (1, 8, 15, 22, 29, 35)	17.3%
II.	School (2, 9, 16, 23, 30, 36)	38.3%
III.	Home and Family (3, 10, 17, 24, 37)	8.8%
IV.	Money, Work, the Future (4, 11, 18, 25, 31, 38)	39.8%
V.	Boy and Girl Relations (5, 12, 19, 26, 32, 39)	12.1%
VI.	Relations to People in General (6, 13, 20, 27, 33, 40)	18.5%
VII.	Self-Centered Concerns (7, 14, 21, 28, 34, 41)	21.7%

Problems of greatest concern to Indian high school youth appear to be in areas IV and II, having to do with money, work, the future, and school. Next appear to be those concerning self (VII) and relations to people (VI). Of least concern seem to be problems of home and family.

The Semantic Differential

A Semantic Differential was administered in the fall of 1967. In this instrument students were asked to react to ten concepts: SCHOOL, TEACHERS, MY SUCCESS IN SCHOOL, MYSELF AS A PERSON, INDIAN, WHITE MAN, MY PRESENT LIFE, MY FUTURE, EDUCATION, COLLEGE. Under each concept, twelve bipolar seven-point scales, using adjective pairs, were presented, three for each of four major factors. The four major factors and their opposite adjective pairs were as follows: Evaluation (cognitive)--good-bad, valuable-worthless, important-unimportant; Evaluation (affective)--pleasant-unpleasant, ugly-beautiful, nice-awful; Potency--weak-strong, shallow-deep, influential-powerless; Activity--fast-slow, busy-idle, active-passive.

The following is the general format used:

SCHOOL

1. Good ___ ___ ___ ___ ___ ___ ___ Bad
2. Weak ___ ___ ___ ___ ___ ___ ___ Strong

etc.

Each scale was scored as follows:

Pleasant _7_ _6_ _5_ _4_ _3_ _2_ _1_ Unpleasant

A score of 1 on the above scale indicates a rating of very unpleasant, 2 - quite unpleasant, 3 - slightly unpleasant, 4 - neutral, 5 - slightly pleasant, 6 - quite pleasant, 7 - very pleasant.

Table 26 presents mean scores of factors under each of the concepts for school types and also for each grade. The score for each factor was derived by averaging the mean scores of the factor's three scales.

Table 26

Mean Scores of Factors for Concepts of Semantic Differential By School Type and By Grade

Factors	School Type Fed. On-Res.	 Fed. Off-Res.	 Pub. On-Res.	 Pub. Off-Res.	Grade 9th	 10th	 11th	 12th	Total Sample
	SCHOOL								
Evaluation (Cog.)	5.88	6.05	5.99	5.96	5.87	5.99	6.03	6.18	5.97
Evaluation (Aff.)	5.35	5.33	5.16	5.04	5.21	5.33	5.23	5.15	5.23
Potency	4.56	4.80	4.87	4.90	4.80	4.66	4.77	4.89	4.78
Activity	5.07	5.24	5.14	5.16	5.16	5.15	5.13	5.16	5.15
	TEACHERS								
Evaluation (Cog.)	5.49	5.58	5.61	5.42	5.44	5.53	5.65	5.63	5.53
Evaluation (Aff.)	5.15	5.11	5.06	4.79	5.01	5.07	5.12	5.00	5.04
Potency	4.44	4.59	4.73	4.68	4.58	4.53	4.66	4.71	4.60
Activity	5.07	5.26	5.16	5.18	5.16	5.18	5.17	5.18	5.17
	MY SUCCESS IN SCHOOL								
Evaluation (Cog.)	5.50	5.63	5.57	5.46	5.46	5.52	5.59	5.79	5.55
Evaluation (Aff.)	5.19	5.15	4.99	4.95	5.08	5.09	5.03	5.10	5.08
Potency	4.53	4.50	4.57	4.52	4.51	4.46	4.53	4.69	4.53
Activity	4.98	5.08	5.01	4.91	5.01	4.93	4.96	5.14	5.00
	MYSELF AS A PERSON								
Evaluation (Cog.)	5.06	5.11	4.98	4.99	5.05	5.01	4.99	5.12	5.04
Evaluation (Aff.)	4.93	5.06	4.91	4.89	4.96	4.96	4.93	4.98	4.95
Potency	4.36	4.46	4.43	4.46	4.41	4.37	4.46	4.53	4.43
Activity	4.88	5.10	4.99	5.04	5.00	4.99	4.96	5.09	5.00
	INDIAN								
Evaluation (Cog.)	5.65	5.71	5.32	5.51	5.56	5.55	5.53	5.57	5.55
Evaluation (Aff.)	5.48	5.56	5.06	5.19	5.37	5.33	5.30	5.29	5.34
Potency	4.77	4.83	4.52	4.77	4.79	4.64	4.67	4.73	4.72
Activity	5.22	5.48	4.97	5.26	5.30	5.28	5.12	5.16	5.24
	WHITE MAN								
Evaluation (Cog.)	4.91	4.88	5.26	4.81	4.83	4.99	5.11	5.15	4.97
Evaluation (Aff.)	4.82	4.74	4.98	4.62	4.72	4.81	4.90	4.84	4.80
Potency	4.32	4.32	4.65	4.27	4.26	4.37	4.54	4.66	4.40
Activity	4.94	4.97	5.18	4.83	4.85	5.00	5.09	5.23	4.99
	MY PRESENT LIFE								
Evaluation (Cog.)	5.44	5.51	5.48	5.38	5.39	5.44	5.45	5.67	5.46
Evaluation (Aff.)	5.26	5.28	5.22	5.16	5.25	5.18	5.21	5.31	5.24
Potency	4.50	4.59	4.58	4.62	4.55	4.50	4.57	4.74	4.57
Activity	5.07	5.25	5.21	5.19	5.14	5.14	5.19	5.34	5.18
	MY FUTURE								
Evaluation (Cog.)	5.58	5.74	5.68	5.70	5.63	5.64	5.70	5.86	5.68
Evaluation (Aff.)	5.39	5.48	5.36	5.40	5.42	5.38	5.38	5.45	5.41
Potency	4.75	4.77	4.78	4.90	4.78	4.75	4.80	4.93	4.80
Activity	5.26	5.40	5.31	5.39	5.33	5.34	5.30	5.42	5.34
	EDUCATION								
Evaluation (Cog.)	6.03	6.13	6.09	6.05	5.95	6.11	6.16	6.28	6.08
Evaluation (Aff.)	5.60	5.63	5.37	5.46	5.51	5.52	5.50	5.59	5.52
Potency	4.87	4.97	5.04	4.97	4.88	4.88	5.03	5.23	4.96
Activity	5.46	5.57	5.47	5.45	5.46	5.50	5.49	5.59	5.49
	COLLEGE								
Evaluation (Cog.)	5.88	6.03	5.95	5.98	5.94	5.98	5.97	5.97	5.96
Evaluation (Aff.)	5.52	5.52	5.38	5.43	5.52	5.47	5.40	5.39	5.46
Potency	4.91	4.95	5.05	5.06	4.93	4.94	5.04	5.14	4.99
Activity	5.49	5.60	5.47	5.53	5.53	5.52	5.51	5.52	5.52

Comparing Semantic Differential Scores by Concepts

A comparison of total sample mean scores for the various concepts in Table 26 reveals that Indian high school students have a high regard for education. EDUCATION was given the highest overall rating of the ten concepts with highest mean scores on both of the Evaluation factors and second highest on the Potency and Activity factors. COLLEGE was rated second highest overall, with the third highest score on Cognitive Evaluation, second highest on Affective Evaluation, and top scores on Potency and Activity. SCHOOL was rated second highest on the Cognitive Evaluation factor, but only sixth on Affective Evaluation. Apparently, school was liked less than it was valued.

Overall rankings of the ten concepts, from highest to lowest, with ratings on each factor shown in parentheses, were as follows:

> EDUCATION (1,1,2,2); COLLEGE (3,2,1,1); MY FUTURE (4,3,3,3); INDIAN (5,4,5,4); SCHOOL (2,6,4,7); MY PRESENT LIFE (8,5,7,5); TEACHERS (7,8,6,6); MY SUCCESS IN SCHOOL (6,7,8,8); MYSELF (9,9,9,9); WHITE MAN (10,10,10,10).

As can be seen, there was great consistency in factor ratings. When subjected to Friedman's rank order of analysis test it was found that differences between concept ratings were significant at the .01 level of confidence.

Apparently, Indian students were quite optimistic about their future, since they rated the concept MY FUTURE third highest. However, a comparatively low self-concept is indicated by the next to last rating of MYSELF AS A PERSON on all four factors. The concept WHITE MAN scored lowest on every factor.

Comparing Semantic Differential Scores By School Types

Differences between ratings assigned to the concepts by the four school types proved to be significant beyond the .05 level of confidence for only three of the ten concepts -- INDIAN, WHITE MAN, and MY FUTURE.

Federal off-reservation school students gave INDIAN a higher rating on every factor than did students of the other types of schools. Federal on-reservation school students rated INDIAN next highest, public-off reservation students next, and public on-reservation students rated INDIAN lowest on every factor. With only one exception, federal schools in the study are segregated, while all public schools are integrated. Apparently, Indian students attending all-Indian schools hold a higher opinion of Indians than do those in integrated school situations.

Public on-reservation school students rated WHITE MAN higher than did other students on every factor, federal on-reservation students rated WHITE MAN next highest overall, federal off-reservation next to lowest overall, and public off-reservation students lowest on every factor. Those students attending school on reservations in an Indian dominated society tended to rate WHITE MAN higher than did those attending school off-reservation in the white man's world.

On the concept MY FUTURE, federal off-reservation school students scored highest overall, followed in order by public off-reservation, public on-reservation and federal on-reservation. Apparently, off-reservation Indian students are more optimistic about the future than are on-reservation students.

Comparing Semantic Differential Scores By Grades

Based upon scores on all factors, differences between the ratings of ninth, tenth, eleventh, and twelfth grade students were significant for three of the ten concepts -- WHITE MAN, MY PRESENT LIFE, and EDUCATION. For each of the three concepts, ratings tended to be higher for each successively higher grade.

When the Cognitive Evaluation factor scores are examined by themselves, the pattern of progressively higher scores for each successive grade is noticeable for all concepts except MYSELF AS A PERSON, INDIAN, and COLLEGE. However, scores on Affective Evaluation do not show the same increase. As Indian students progress through high school it appears that they place an increasing value on school, teachers, education, their success in school, their present life, their future, and white people, but experience no increased positive feeling toward them.

Scores on Potency and Activity factors vary only little by grades for most concepts. Exceptions are increases in Activity ratings for WHITE MAN, and in Potency ratings for WHITE MAN, EDUCATION, and COLLEGE.

Comparing Semantic Differential Scores By Areas

Semantic Differential scores are presented by areas in Table 27. Ratings by the Indian students in the five geographic areas differed significantly on every concept except SCHOOL. The following are some observations on the ratings:

Table 27

Mean Scores of Factors for Concepts of Semantic Differential By Area and By Sex

	Area					Sex		Total
Factors	Aberdeen	Muskogee	Navajo	Phoenix	Juneau	M	F	Total Sample
	SCHOOL							
Evaluation (Cog.)	5.89	5.87	6.08	5.84	6.08	5.95	5.99	5.97
Evaluation (Aff.)	4.94	4.93	5.54	5.21	5.02	5.22	5.24	5.23
Potency	4.87	4.84	4.71	4.57	5.09	4.75	4.81	4.78
Activity	5.09	5.32	5.19	5.01	5.29	5.17	5.14	5.15
	TEACHERS							
Evaluation (Cog.)	5.38	5.27	5.70	5.32	5.79	5.48	5.57	5.53
Evaluation (Aff.)	4.68	4.47	5.39	5.00	5.16	4.95	5.12	5.04
Potency	4.62	4.58	4.59	4.47	4.87	4.53	4.67	4.60
Activity	5.04	5.13	5.25	5.05	5.43	5.16	5.18	5.17
	MY SUCCESS IN SCHOOL							
Evaluation (Cog.)	5.48	5.63	5.61	5.42	5.61	5.57	5.53	5.55
Evaluation (Aff.)	4.88	5.25	5.25	5.00	4.89	5.10	5.06	5.08
Potency	4.59	4.67	4.51	4.38	4.59	4.59	4.47	4.53
Activity	4.98	5.24	5.04	4.85	4.96	5.05	4.96	5.00
	MYSELF AS A PERSON							
Evaluation (Cog.)	5.02	5.36	5.10	4.93	4.77	5.13	4.96	5.04
Evaluation (Aff.)	4.98	5.29	4.99	4.84	4.66	4.99	4.92	4.95
Potency	4.57	4.70	4.35	4.30	4.35	4.53	4.33	4.43
Activity	5.04	5.38	4.98	4.86	4.94	5.06	4.95	5.00
	INDIAN							
Evaluation (Cog.)	5.50	6.03	5.68	5.33	5.18	5.50	5.61	5.55
Evaluation (Aff.)	5.26	5.67	5.47	5.24	4.90	5.26	5.41	5.34
Potency	4.75	5.07	4.70	4.59	4.68	4.75	4.70	4.72
Activity	5.02	5.67	5.35	5.22	5.12	5.26	5.22	5.24
	WHITE MAN							
Evaluation (Cog.)	4.64	4.37	5.25	4.91	5.29	4.92	5.01	4.97
Evaluation (Aff.)	4.37	4.19	5.14	4.76	5.11	4.75	4.84	4.80
Potency	4.29	4.08	4.49	4.29	4.75	4.32	4.46	4.40
Activity	4.74	4.51	5.25	4.87	5.20	4.88	5.09	4.99
	MY PRESENT LIFE							
Evaluation (Cog.)	5.49	5.60	5.48	5.32	5.35	5.48	5.44	5.46
Evaluation (Aff.)	5.21	5.39	5.34	5.08	5.01	5.24	5.23	5.24
Potency	4.74	4.72	4.48	4.41	4.63	4.64	4.51	4.57
Activity	5.20	5.38	5.17	5.05	5.22	5.17	5.19	5.18
	MY FUTURE							
Evaluation (Cog.)	5.81	6.00	5.63	5.40	5.68	5.57	5.77	5.68
Evaluation (Aff.)	5.50	5.70	5.42	5.16	5.30	5.30	5.51	5.41
Potency	5.03	5.09	4.66	4.57	4.90	4.80	4.80	4.80
Activity	5.43	5.67	5.30	5.16	5.29	5.30	5.38	5.34
	EDUCATION							
Evaluation (Cog.)	6.02	5.94	6.19	5.90	6.19	6.02	6.13	6.08
Evaluation (Aff.)	5.32	5.45	5.76	5.31	5.46	5.45	5.58	5.52
Potency	5.13	5.00	4.89	4.71	5.21	4.96	4.97	4.96
Activity	5.45	5.50	5.59	5.34	5.48	5.45	5.53	5.49
	COLLEGE							
Evaluation (Cog.)	5.98	6.05	6.02	5.69	6.03	5.87	6.04	5.96
Evaluation (Aff.)	5.39	5.52	5.64	5.19	5.34	5.40	5.53	5.46
Potency	5.18	5.08	4.91	4.73	5.15	4.96	5.01	4.99
Activity	5.55	5.63	5.57	5.30	5.53	5.47	5.57	5.52

1. The Juneau area gave TEACHERS and WHITE MAN the highest ratings, followed closely in each case by the Navajo area. The lowest ratings were given these two concepts by the Muskogee area. The Aberdeen area also rated WHITE MAN very low, with next to lowest scores on all four factors.
2. The Muskogee area rated INDIAN highest and the Juneau area rated INDIAN lowest.
3. Muskogee area students seemed to evidence greater self-esteem and confidence than students in other areas by registering the highest scores on all factors for MY SUCCESS IN SCHOOL, MYSELF AS A PERSON, INDIAN, and MY FUTURE. The Muskogee area also scored highest on three factors and second on the fourth factor for the concept MY PRESENT LIFE.
4. The Aberdeen area scored high on MYSELF AS A PERSON, MY PRESENT LIFE, and MY FUTURE, ranking second to Muskogee on each concept.
5. The Phoenix area rated the following concepts lower than did the other areas: MY SUCCESS IN SCHOOL, MY PRESENT LIFE, MY FUTURE, EDUCATION, and COLLEGE.
6. The Navajo and Juneau areas rated EDUCATION higher than did the other three areas.
7. COLLEGE was rated highest by the Muskogee area.

Comparing Semantic Differential Scores By Sexes

It is evident in Table 27 that females generally rated the concepts higher than did males. Girls rated TEACHERS, WHITE MAN, EDUCATION, and COLLEGE higher on every factor, and SCHOOL and MY FUTURE higher on three of the four factors. Exceptions to the general trend appear for the concepts MY SUCCESS IN SCHOOL and MYSELF AS A PERSON, which were rated higher by boys than by girls on all four factors, and MY PRESENT LIFE, which was rated higher by boys on three factors. Indian boys seem to have a better self-concept and greater confidence in themselves than do girls, but may have less optimism about the future.

Responses to School Interest Inventory

In the spring of 1968 the School Interest Inventory was administered to 2164 Indian high school students. On this instrument each student was asked to respond to 150 statements by marking them true or false. Table 28 presents percentages of true and false responses to certain items which have been selected for presentation because of their information value. Some of the items presented in Table 28, like numbers 31 and 73, are not used in scoring the tests but do provide valuable personal and familial data. Other items, like numbers 8 and 93, are meaningful for individuals but not for group analysis, and are omitted. Item numbers in Table 28 correspond to item numbers in the instrument. It will be noted that the percentages do not always add to 100 percent, because some items received no response from a small percentage of students.

Table 28

Responses to Selected School Interest Inventory Items In Percentages for Total Sample

Items		True	False
2.	In order to succeed in a job today, you must have a good education.	97	3
5.	I take part in at least one school activity.	71	28
7.	No one in our family spends much time reading magazines or books.	32	68
10.	I have many friends.	89	8
12.	I would rather have a job than go to school.	18	81
13.	Except for my parents, most of my family will be college graduates.	37	62
16.	To get a job like my father's, I will have to finish high school.	66	33
18.	I have never failed to move with my class to the next grade.	73	26
21.	Most of the houses in our neighborhood cost more than $12,000.	24	74
22.	I would like to get married right now.	9	90
24.	School is fun.	78	19
25.	I would be happier in school if I could buy better clothes.	50	49
31.	My father earned more than $3000 last year.	34	60
34.	When I am old enough, I am going to quit school.	8	91
36.	There is at least one bedroom for every two people in our family.	57	42
37.	Even though I do my best, my grades are always below average.	39	60
39.	I have been sent to the school principal's office frequently for causing trouble in class.	12	88
40.	I do not like the subjects I have to take in school.	24	76
42.	I like to take part in sports.	84	15
43.	I am not doing well in school, but I do better outside school than most of my classmates.	38	61
45.	The teachers in our school do not seem to understand me.	30	69
48.	Our family has lots of fun together.	77	22
49.	My father changes jobs frequently.	20	77
50.	My mother did not complete eighth grade.	38	61
54.	Everyone in our family goes his own way.	35	63
55.	I am confident of my ability in school.	71	27
58.	Most people do not understand me.	40	59
60.	My father wants me to complete high school.	94	5
61.	I skip school at least once a month.	26	74
63.	My father did not complete high school.	66	31
64.	I feel my father favors other members of my family over me.	34	63
66.	Our family moves approximately once a year.	13	85
67.	I would rather quit than fail in school.	20	79
72.	I like school.	83	15
73.	I drive a car to school.	9	90
75.	I have been absent from school more than twenty days in the last year.	21	78
76.	My mother completed high school.	28	70
77.	I would rather write stories than repair machines.	36	62
79.	I have never been suspended from school.	81	17
81.	I like to skip school.	20	78
84.	My father works with his hands.	78	18

Continuation of Table 28

Items		True	False
87.	I will have to help support younger members of my family while they go to school.	51	47
90.	I would rather stay home than go to school.	18	80
91.	My father likes to read.	57	39
94.	Counting my parents and me, there are more than five people in our family.	77	22
96.	Our family does very little together that is fun.	40	58
97.	None of my family is interested in college work.	22	76
99.	I have had to repeat at least one grade.	31	67
101.	I would like a job in which I would be working with people rather than machines.	70	28
102.	My parents usually go to church every week.	50	47
103.	I have been sent out of class frequently for causing trouble.	9	89
105.	I have more then two brothers or sisters.	74	23
107.	I would rather work with mechanical things than read.	50	47
108.	When I am absent from school I make up my assignments.	69	28
109.	Our family subscribes to at least five magazines.	31	66
111.	I would rather be in school than working full time.	73	24
114.	My father works at a desk most of the time.	13	82
115.	I am not going to get married until I finish school.	86	11
116.	It is hard traveling to and from school because we live so far away.	35	62
118.	I seldom skip school.	57	39
122.	I would never want to be expelled from school.	86	10
124.	My parents are not very active in church work.	46	50
125.	Most of my brothers and sisters did not finish high school.	26	70
126.	I am not "going steady."	66	30
130.	I would rather be taking school subjects other than the ones I am now taking.	47	48
132.	Most of the people in my homeroom have better clothes than I do.	32	62
134.	I have never skipped school.	39	56
135.	We rent our home.	25	71
136.	I get at least average grades in school.	77	19
137.	My father has to wear a suit to work.	10	83
141.	I have more friends of the opposite sex than of my own sex.	29	64
142.	What I learn in school will help very much in earning a living.	87	8
144.	I am afraid that I will not be promoted this year.	30	65
145.	My father did not complete eighth grade.	39	54

Comparing School Interest Inventory Scores by School Types and Areas

The School Interest Inventory can be scored to obtain either weighted or unweighted totals. The weighted method, which assigns values of 1 to 9 for each item, is used in this study. Boys and girls are scored on different scales and, therefore, their scores are not comparable. The scale for boys contains 90 items and has a potential total score of 375, while the scale for girls has 86 items and a potential score of 337. There are 72 items common to both scales. Some items in the Inventory are not used for scoring on either scale.

As in golf and cross country, the lower score is the better score. High scores on the School Interest Inventory indicate lack of interest in school and high probability of dropout. In this study, mean weighted scores are used to compare the interest in school of Indian students in different types of schools and in different geographic areas. These scores are presented in Table 29. Since scores registered by boys and girls are not comparable they are presented separately.

Table 29

Mean Weighted Scores of Indian High School Students
On The School Interest Inventory
By School Types and Areas
Spring 1968

	SCHOOL TYPES				AREAS				
	Federal On-Res.	Federal Off-Res.	Public On-Res.	Public Off-Res.	Aberdeen	Muskogee	Navajo	Phoenix	Juneau
Male	120.84	114.03	100.73	108.94	102.65	118.96	123.24	111.51	111.09
Female	100.39	94.95	94.54	99.97	98.26	99.60	92.76	102.32	88.69

Inspection of Table 29 reveals that the mean scores for males differ considerably for the four school types and also for the five areas, while female scores for areas differ somewhat less than do male scores, and differ even less for school types. To test the differences for significance, analysis of variance was used. The results are presented in Table 30.

Table 30

Analysis of Variance
Of School Interest Inventory Mean Scores

	SCHOOL TYPES -- Male				AREAS -- Male			
Source of Variation	Degrees of Freedom	ss	ms	F	Degrees of Freedom	ss	ms	F
Total Sample	1066	2300964			1066	2300964		
Within Groups	1063	2240031	2107		1062	2228820	2098	
Difference	3	60933	20311	9.63*	4	72144	18036	8.59*
	SCHOOL TYPES -- Female				AREAS -- Female			
Source of Variation	Degrees of Freedom	ss	ms	F	Degrees of Freedom	ss	ms	F
Total Sample	1096	1719953			1096	1719953		
Within Groups	1093	1712221	1566		1092	1701572	1558	
Difference	3	7732	2577	1.64***	4	18381	4595	2.94**

* Significant beyond the .01 level
** Significant beyond the .05 level
*** Not significant

Interest in school, as measured by the School Interest Inventory, differed significantly for boys in the four types of school, with those in public on-reservation schools registering the greatest interest and those in federal on-reservation schools the least. Differences were also significant for boys in the five geographic areas, with those in the Aberdeen area registering the greatest interest in school and those in the Navajo area the least.

Differences for girls by school types were not significant. However, differences for girls by areas were significant, with those in the Juneau area registering the greatest interest and those in the Phoenix area the least.

When male and female scores are considered together and a combined ranking is determined for school types, the order from greatest interest to least interest is as follows: public on-reservation, public off-reservation, federal off-reservation, federal on-reservation. Similarly, the order for areas is as follows: Juneau, Aberdeen, Phoenix, Navajo, Muskogee. It is interesting that the order of rank of areas on the School Interest Inventory is identical to the academic achievement ranking appearing in Table 17.

There are no tables of normative data for the School Interest Inventory. However, some comparison can be made of mean scores for Indian students in this study with mean scores for non-Indian students in other studies. A study in one high school found that the mean weighted score for male students who stayed in school was 51.98, while the mean weighted score for male students who later dropped out was 116.52. For females the scores were 56.91 for stay-ins and 103.77 for dropouts. A study of students in four other schools found mean scores of 72.69 for male stay-ins, 137.20 for male dropouts, 60.49 for female stay-ins, and 110.02 for female dropouts.[1]

It is evident from the above figures that mean scores for Indian students tend to run high, almost approaching dropout levels. This, of course, is consistent with the high dropout rates for Indian students, which have been found to be 39 percent in the Southwest[2] and 48 percent in the Northwest[3] from enrollment in grade eight to graduation from high school.

The School Interest Inventory has proved to be a useful instrument for identifying potential school dropouts. However, its value with American Indian students was not known. In the interests of investigating the predictive value of the SII for Indians some further analyses were attempted on a small scale.

Since the SII was administered in the spring of 1968, those students who were enrolled in grade nine at that time normally would have graduated in the spring of 1971. Computer printouts of names of ninth grade students who had taken the SII in 1968 were mailed to selected schools with the request that the students listed be identified as graduates, dropouts, or transfers. Unfortunately, some school officials were unable to classify a majority of those who had withdrawn as either definite dropouts or transfers, and a fourth classification of "unknown" was added. Furthermore, as no attempt was made to follow-up those who were identified as transfers, it was not possible to determine whether they were eventually dropouts or graduates.

Responses were received from four BIA schools and six public schools as widely scattered in location as Alaska, Arizona, Utah, New Mexico, Oklahoma, Nebraska, and South Dakota. Table 31 shows the number of students in each classification and the average weighted score registered on the SII by the students so classified.

Table 31

Average Weighted Scores of Indian High School Graduates, Transfers and Unknowns, and Dropouts on the School Interest Inventory

Classification	N	Average Score
Graduates	281	111
Transfers and Unknowns	140	122
Dropouts	63	136

It is evident from the average scores in Table 31 that the SII does discriminate to some degree between Indian graduates and dropouts. However, an examination of single scores leads one to the conclusion that identification of dropouts on an individual basis would be difficult.

An inspection of test items reveals some that seem inappropriate for Indians. An item analysis was made of the responses of the graduates and dropouts to determine which items seem to discriminate and which do not. Some items which discriminate between graduates and dropouts for the general school population but do not for Indian students are the following:

4. I have more than one older brother or sister.
16. To get a job like my fathers I will have to finish high school.
30. My parents are active in community affairs.
33. My mother does a lot of church work.
47. I like love scenes on television.
50. My mother did not complete eighth grade.
63. My father did not complete high school.
76. My mother completed high school.
84. My father works with his hands.
94. Counting my parents and me, there are more than five people in my family.
141. I have more friends of the opposite sex than of my own sex.
145. My father did not complete eighth grade.

Other discrepancies appeared in responses by boys to questions about clothes and by girls to questions about age. Items 25 and 132, "I would be happier in school if I could buy better clothes," and "Most of the people in my homeroom have better clothes than I do," did not discriminate for Indian boys, although they did for girls. Also, items 88, 93 and 138, "I am one of the oldest in my homeroom," "Most of my friends are older than I," and "I am older than most of the people in my class" did not discriminate for Indian girls, although they did for boys.

Among the items that seem to discriminate for Indian students but do not for others are the following:

6. It would be more fun to go to an art gallery than to a showing of new cars (Indian graduates tended to answer this "true", and dropouts to answer it "false."
31. My father earned more than $3000 last year.
52. I am not at ease with others.
140. My mother encourages me to do well in school.

It appears that the School Interest Inventory could be a useful instrument for identifying high dropout risks among Indian students if some modifications were made in scoring based on the item analysis of responses of dropouts and graduates.

The California Psychological Inventory and the Value Orientation Scale

Five measures from the California Psychological Inventory (CPI) were used: CS (Capacity for Status), SP (Social Presence), AC (Achievement via Conformance), SA (Self-Acceptance), and AI (Achievement via Independence). According to the test manual these measures were designed to assess characteristics of personality as described below.

CS - To serve as an index of an individual's capacity for status (not his actual or achieved status). The scale attempts to measure the personal qualities which underlie and lead to status.

SP - To assess factors such as poise, spontaneity, and self-confidence in personal and social interaction.

AC - To identify those factors of interest and motivation which facilitate achievement in any setting where conformance is a positive behavior.

SA - To assess factors such as personal worth, self-acceptance, and capacity for independent thinking.

AI - To identify those factors of interest and motivation which facilitates achievement in any setting where autonomy and independence are positive behaviors.[4]

Also, a value scale,[5] developed by Strodtbeck, was used as a measure of acculturation to middle class values. This Value Orientation Scale consisted of eight true and false questions as follows:

1. Planning only makes a person unhappy since your plans hardly ever work out anyway.

2. When a man is born, the success he's going to have is already in the cards, so he might as well accept it and not fight against it.
3. Nowadays, with world conditions the way they are, the wise person lives for today and lets tomorrow take care of itself.
4. Even when teenagers get married, their main loyalty still belongs to their fathers and mothers.
5. When the time comes for a boy to take a job, he should stay near his parents, even if it means giving up a good job opportunity.
6. Nothing in life is worth the sacrifice of moving away from your parents.
7. The best kind of a job to have is one where you are part of an organization, all working together, even if you don't get individual credit.
8. It's silly for a teenager to put money into a car when money could be used to get started in business or for an education.

The first three questions have to do with time orientation and mastery over one's destiny. Questions 4-6 measure familism versus individualism, and loyalty to extended family versus loyalty to nuclear family. Question 7 tests for group versus individual orientation. Question 8 deals with immediate versus postponed gratification.

It was hypothesized that those holding values of the dominant culture would tend to answer the first seven questions, "false," and the last question, "true," while those more oriented toward traditional Indian values would tend to answer the questions in the opposite way. In using the Value Orientation Scale as a measure of orientation to values of the dominant culture, scores were computed by totaling the number of "middle class" answers. Thus, a higher score indicated a greater degree of orientation to middle class values.

Table 32 presents mean scores, by types of school and by sex, for each of the five scales of the CPI which were used, and for the Value

Orientation Scale. Differences in means were tested for significance by analysis of variance.

Table 32

Mean Scores for Five California Psychological
Inventory Scales and the Value Orientation Scale
by School Type and Sex
Spring, 1969

	Capacity for Status		Social Presence		Achievement via Conformance		Self-Acceptance		Achievement via Independence		Value Orientation	
	M ***	F ***	M **	F *	M ***	F ***	M ***	F *	M *	F *	M ***	F *
1) Federal On-Reservation	13.1	11.8	28.1	26.5	18.8	18.8	16.0	15.2	12.8	13.0	4.2	4.3
2) Federal Off-Reservation	12.5	12.0	29.2	27.5	18.4	18.9	16.1	15.5	11.4	12.0	4.4	4.5
3) Public On-Reservation	13.2	11.9	29.5	27.0	18.5	18.2	16.7	16.2	12.6	12.6	4.2	4.4
4) Public Off-Reservation	12.8	12.4	29.6	29.4	18.9	19.0	16.9	17.5	12.6	13.2	4.3	4.9

* Differences are significant at the .01 level.
** Differences are significant at the .05 level.
*** Differences are not significant at the .05 level.

Differences between scores for school types were not significant, either for males or females, on CAPACITY FOR STATUS, or on ACHIEVEMENT VIA CONFORMANCE. Significant differences were found, for both males and females, on SOCIAL PRESENCE and on ACHIEVEMENT VIA INDEPENDENCE, for females on SELF-ACCEPTANCE, and for females on VALUE ORIENTATION.

Public off-reservation students scored highest on SOCIAL PRESENCE, while federal on-reservation students scored lowest.

Public off-reservation and federal on-reservation students scored highest on ACHIEVEMENT VIA INDEPENDENCE, public on-reservation students ranked next, and federal off-reservation students ranked lowest.

On SELF-ACCEPTANCE, female students in public off-reservation schools scored highest, public on-reservation next, then federal off-reservation, and federal on-reservation lowest. While differences in scores for males were not significant, it is interesting to note that they follow the same pattern.

Females in public off-reservation schools indicated a higher degree of acculturation than those in other types of schools by scoring highest on VALUE ORIENTATION, while those in federal on-reservation schools scored lowest. Differences were not significant for males.

Differences between scores for areas were significant in most instances, as can be seen in Table 33.

Table 33

Mean Scores for Five California Psychological
Inventory Scales and the Value Orientation Scale
by Area and Sex
Spring, 1969

	Capacity for Status		Social Presence		Achievement via Conformance		Self-Acceptance		Achievement via Independence		Value Orientation	
Area	M **	F *	M *	F *	M ***	F **	M ***	F *	M ***	F ***	M *	F *
1) Aberdeen	12.3	12.0	30.0	28.4	18.5	17.9	16.3	16.4	12.0	12.6	4.5	4.9
2) Muskogee	12.6	13.3	31.4	29.8	19.2	19.4	17.1	17.9	11.9	12.3	4.6	4.9
3) Navajo	12.3	12.0	28.2	25.9	18.7	19.1	16.4	15.1	12.7	12.8	4.0	3.9
4) Phoenix	12.9	11.2	28.2	27.2	18.1	18.9	16.3	15.5	12.3	12.6	4.0	4.5
5) Juneau	13.2	12.3	29.3	28.8	19.6	19.3	16.4	16.7	12.4	12.8	4.6	5.0

* Differences in scores are significant at the .01 level.
** Differences in scores are significant at the .05 level.
*** Differences in scores are not significant at the .05 level.

When area scores in Table 33 are examined and compared, the following facts become apparent:

1. Juneau males and Muskogee females scored higher than their counterparts from other areas on CAPACITY FOR STATUS.
2. Muskogee students, both male and female, scored substantially higher than students from other areas on SOCIAL PRESENCE. Next highest were Aberdeen and Juneau, followed by Phoenix and Navajo.
3. Muskogee and Juneau students ranked highest on ACHIEVEMENT VIA CONFORMANCE.
4. Muskogee area female students ranked highest on SELF-ACCEPTANCE, followed by Juneau, Aberdeen, Phoenix, and Navajo. Muskogee and Juneau male students also ranked highest, although differences were not significant.
5. Differences in scores for ACHIEVEMENT VIA INDEPENDENCE were not significant, either for males or females. However, it is interesting that both male and female students in the Navajo area scored highest on this factor.
6. The orders of rank on VALUE ORIENTATION are very similar for males and females. Considering the scores of boys and girls together on this measure of acculturation, Juneau students rank highest, followed by Muskogee, Aberdeen, Phoenix, and Navajo.

An examination of Table 34 reveals that scores tend to increase for each successive grade, with twelfth grade students scoring higher than tenth in every instance, and higher than eleventh with only one exception. Differences in scores between grades were significant in six of the twelve cases. Attention is directed to gains on SOCIAL PRESENCE and VALUE ORIENTATION from grade ten to grade twelve. Apparently the school has a strong socializing and acculturating effect upon students.

Table 34

Mean Scores for Five California Psychological
Inventory Scales and the Value Orientation Scale
by Grade and Sex
Spring, 1969

	Capacity for Status		Social Presence		Achievement via Conformance		Self-Acceptance		Achievement via Independence		Value Orientation	
Grade	M ***	F ***	M **	F **	M *	F ***	M ***	F ***	M **	F ***	M **	F *
10	12.7	12.0	28.6	27.4	18.0	18.7	16.1	15.8	11.9	12.4	4.1	4.2
11	13.0	11.6	29.0	27.0	19.0	18.3	16.5	15.8	12.8	12.7	4.3	4.6
12	13.2	12.4	30.0	28.3	19.2	19.4	16.8	16.4	12.4	13.1	4.5	4.9

* Differences in scores are significant at the .01 level.
** Differences in scores are significant at the .05 level.
*** Differences in scores are not significant at the .05 level.

Table 35

Mean Scores for Five California Psychological
Inventory Scales and the Value Orientation Scale
by Sex
Spring, 1969

		Capacity for Status	Social Presence	Achievement via Conformance	Self-Acceptance	Achievement via Independence	Value Orientation
Sex	N	*	*	***	**	***	*
Male	815	12.9	29.1	18.6	16.4	12.3	4.3
Female	850	12.0	27.5	18.8	15.9	12.6	4.5

* Differences in scores are significant at the .01 level.
** Differences in scores are significant at the .05 level.
*** Differences in scores are not significant at the .05 level.

Males scored higher than females on all scales for which differences in scores were significant, except on VALUE ORIENTATION. The scores indicate that boys in the sample are more ambitious and self-seeking, feel more self-confident in social interaction, and have a greater sense of personal worth than girls, but that girls are more oriented to the values of the dominant culture.

The Vocational Aspiration Scale

A vocational aspiration scale was devised to measure the differential between level of occupational desire and level of occupational expectation of Indian high school students. The instrument was administered in the spring of 1970 to 1,286 students in grades eleven and twelve.

In constructing the instrument, 110 occupations were selected for each sex and listed in order of general standing as determined by reference to rankings appearing in various studies. Eleven groups of occupations were then formed from the list, each group containing one occupation from the ten highest occupations listed, one from the next ten highest on the list, and so on down to one from the lowest ten on the list. In each of the eleven groups, then, ten occupations were listed, each one representing a different level of occupational standing from high to low.

Each group of ten occupations was presented to the examinee at three different points in the instrument. At one point the examinee was asked to rate the occupations from one to ten on the basis of general standing, at another point to indicate which job in the group he would choose to have in the future if free to have any one he wished, and at still another point to check the job which he feels is the best one he is really sure that he can get in the future.

Table 36 presents the eleven occupation groupings appearing in the Vocational Aspiration Scale for Males and the order of rank in each group as determined by the mean ratings of the 635 male respondents. Table 37 presents the same information for the 651 female respondents.

Table 36

GROUPS OF OCCUPATIONS APPEARING IN
THE VOCATIONAL ASPIRATION SCALE FOR MALES
WITH RANKINGS

6 Fireman
8 Trader
7 Bookkeeper
10 Janitor
3 Electric or telephone lineman
1 Physician (doctor)
5 Athletic coach
4 Veterinarian
9 Bartender
2 Diplomat in the U.S. Foreign Service

3 Dentist
6 Newspaper reporter
9 Farm laborer
4 Policeman
5 School teacher
1 United States senator
10 Fisherman
8 Mail sorter
2 Airline pilot
7 Miner

4 Surveyor
1 Lawyer
10 Theater usher
8 Baker
2 Geologist
9 Shoemaker
7 Guard or nightwatchman
6 Store manager
5 Forest ranger
3 Professional athlete (baseball, football, basketball, golf, etc.)

1 Nuclear physicist
4 Actor
6 Barber
8 Medicine man
7 Mail carrier
5 Oilfield roughneck
2 Biologist
9 Undertaker
3 Heavy machine operator
10 Soda fountain clerk

5 Commercial artist
2 Computer programmer
1 State governor
4 Sociologist
7 Post office clerk
8 Highway crewman
10 Sheepherder
3 Psychologist
6 Power plant operator
9 Nurseryman

10 Clothes presser
5 Radio announcer
3 Draftsman
6 Author of novels
9 Taxicab driver
8 Sailor or deckhand
7 Bricklayer or plasterer
4 Ship captain
2 Architect
1 U.S. Supreme Court justice

9 Cook
6 Printer
10 Elevator operator
8 Jockey
1 Scientist
5 Clergyman
2 Electrician
7 Hunting and fishing guide
3 Professional musician
4 Social or welfare worker

1 College professor
3 Artist or sculptor
8 Logger
5 Silversmith
4 Tribal chairman or chief
6 Farmer
7 Bus or truck driver
2 School superintendent
9 Ranch cowboy
10 Floor scrubber

6 Stockman
7 Plumber
8 Housepainter
1 Engineer (civil, chemical, etc.)
5 Professional rodeo performer
9 Hunter and trapper
10 Dishwasher
2 Cabinet member in federal government
4 Public relations man
3 County agricultural agent

10 Gas station attendant
7 TV announcer
6 Welder
2 State senator
8 Sheet metal worker
9 Railroad track worker
4 Certified public accountant
1 Ambassador to a foreign government
3 Auto or airplane mechanic
5 Radio or TV repairman

2 Pharmacist
3 Factory machine operator
8 Surveyor's helper
10 Bootblack
7 Oilfield driller
9 Salesman
4 Carpenter
1 Head of a department in a state government
5 Newspaper editor
6 Photographer

Table 37

GROUPS OF OCCUPATIONS APPEARING IN
THE VOCATIONAL ASPIRATION SCALE FOR FEMALES
WITH RANKINGS

2 Secretary
8 Housewife
5 Model
4 Buyer for a department store
1 Ambassador to a foreign country
6 Actress
3 Receptionist
9 Janitress
10 Dishwasher
7 Librarian assistant

6 Teacher aide
9 Laundry worker
10 Floor scrubber
5 Typist
2 Registered nurse
1 Head of a department in a state government
4 Speech therapist
7 Postmistress
3 Airline stewardess
8 Owner-operator of a lunch stand

5 Keypunch operator
3 Social or welfare worker
10 Sandwich girl
1 State senator
2 Scientist
4 Certified public accountant
9 Clothes presser
7 Printer
8 Grocery clerk
6 Photographer

8 Baker
9 Waitress
6 Store manager
3 Physician (doctor)
5 School teacher
1 Diplomat in the U.S. Foreign Service
2 Medical technician
4 Sociologist
7 Dressmaker
10 Table girl in a cafeteria

2 Dentist
5 Librarian
8 Mail sorter
4 Author of novels
3 Interior decorator
10 Baby sitter
6 Post office clerk
7 Policewoman
9 Nightclub singer
1 United States senator

6 Telephone operator
5 Professional musician
4 Biologist
1 Physical therapist
7 Newspaper reporter
3 Practical nurse
2 Lawyer
9 Taxicab driver
8 Newsstand operator
10 Carhop at a drive-in restaurant

1 Nuclear physicist
3 Artist or sculptor
9 Theater usher
5 File clerk
6 Radio announcer
7 Athletic coach (swimming, golf, etc.)
2 Psychologist
10 Sheepherder
4 Public relations woman
8 Hairdresser

8 Manicurist
5 Commercial artist
4 Architect
3 Computer programmer
6 Beautician
2 School superintendent
1 State governor
7 Professional rodeo performer
9 Grocery checker
10 Kitchen aide

6 Dietician
7 TV announcer
4 Stenographer
10 Barmaid
8 Dormitory attendant
2 Pharmacist
3 Engineer (civil, electrical, etc.)
5 Professional athlete (golf, tennis, etc.)
1 U.S. Supreme Court justice

1 College professor
3 Office clerk
5 Church Christian education director
7 Cashier in a store or restaurant
9 Soda fountain clerk
10 House cleaner
8 Cook
6 Draftsman
2 School principal
4 Veterinarian

10 Elevator operator
2 Bank teller
1 Cabinet member in the federal government
3 Bookkeeper
6 Factory operator
9 Timekeeper
8 Professional dancer
4 County home economics agent
7 Clothes designer
5 Newspaper editor

Inspection of Tables 36 and 37 reveals a number of ratings that would seem to suggest either a lack of information about occupations or possibly some cultural bias. For example, boys rated computer programmer higher than sociologist or psychologist, electric or telephone lineman higher than veterinarian, factory machine operator and carpenter higher than newspaper editor, auto or airplane mechanic higher than certified public accountant, heavy machine operator higher than actor, oilfield roughneck and mail carrier higher than undertaker, electrician higher than clergyman, and welder higher than TV announcer. Girls rated medical technician higher than physician or sociologist, physical therapist higher than lawyer, practical nurse higher than biologist, file clerk higher than radio announcer, computer programmer higher than architect, stenographer higher than dietician or TV announcer, bank teller higher than newspaper editor, office clerk higher than veterinarian or draftsman, airline stewardess higher than speech therapist, and teacher aide higher than postmistress.

In general, the Indian high school students rated the occupations of lower standing quite accurately but did not display the same judgment in ranking the occupations considered to be of higher standing. This may reflect the low socioeconomic backgrounds of most of the students and their consequent lack of first hand acquaintance with many of the higher prestige occupations.

In determining the differential between occupational desire and occupational expectation for each examinee, the difference was computed between the ranking of the preferred job in each group and the best expected job in that group, using the examinee's own job ratings. A total score for each subject was then computed by subtracting the sum of the desired occupation scores from the sum of the expected occupation scores. Scores ranged from +84 to -32. If expectations were lower in rank than preferences, a positive differential resulted. There were many cases of preference for jobs having lower standings than the jobs the examinee thought he could get, resulting in negative scores for about one-third of the examinees. However the mean differential score for girls was +7.6 and for boys was +9.4, indicating that, in general, vocational expectations were somewhat lower than were aspirations, and that boys, more than girls, felt that they would not be able to procure jobs of as high ranking as they would like.

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VII. RELATIONSHIPS BETWEEN VARIABLES

Variables Measured

In order to explore the possible relationships between certain variables measured by the various instruments administered during the study, Pearson product moment coefficients of correlation were computed. The following factors were used.

1. Academic Achievement, as measured by the total battery score on the California Achievement Test (CAT).

2. Mental Ability, as measured by the California Test of Mental Maturity (CTMM).

3. Value Orientation, as measured by the Value Orientation Scale (VOS).

4. Self-Concept, as measured by the combined scores of three California Psychological Inventory (CPI) scales--Capacity for Status, Social Presence, and Self-Acceptance.

5. Self-Concept, as measured by responses on the Semantic Differential (SD) to the concepts MY SUCCESS IN SCHOOL, MYSELF AS A PERSON, INDIAN, MY PRESENT LIFE, and MY FUTURE.

6. Acculturation, as measured by 16 questions on the Questionnaire (Q).

7. Acculturation, as measured by 23 selected items from the School Interest Inventory (SII).

8. Achievement Motivation, as measured by the Achievement Via Conformance (AC) scale of the California Psychological Inventory (CPI).

9. Achievement Motivation, as measured by the Achievement Via Independence (AI) scale of the California Psychological Inventory (CPI).

10. Vocational Aspiration-Expectation Differential, as measured by the Vocational Aspiration Scale (VAS).

Pearson product moment coefficients of correlation were computed in one operation between all of the above ten variables in order to provide a matrix as presented in Table 38. This procedure limited the sample to 391 students for whom there were data on every variable.

Table 38

COEFFICIENTS OF CORRELATION
BETWEEN ALL VARIABLES

	1	2	3	4	5	6	7	8	9	10
1. Achievement (CAT)	1.000	.668*	.314*	.242*	.091	.235*	.007	.189*	.093	.294*
2. Mental Ability (CTMM)		1.000	.231*	.248*	.076	.373*	.147	.077	.017	.290*
3. Value Orientation (VOS)			1.000	.242*	.041	.179*	.033	.209*	.181*	.128
4. Self-Concept (CPI)				1.000	.074	.272*	.171*	.536*	.370*	.188*
5. Self-Concept (SD)					1.000	.154*	.158*	.092	-.100	.099
6. Acculturation (Q)						1.000	.400*	.038	-.104	.259*
7. Acculturation (SII)							1.000	.109	-.042	.067
8. Achievement Motivation (AC)								1.000	.510*	.077
9. Achievement Motivation (AI)									1.000	.093
10. Vocational Aspiration-Expectation Differential (VAS)										1.000

*Significant at the .01 level.

Correlations Between Achievement and Other Variables

As can be seen in Table 38, academic achievement proved to be correlated significantly in the positive direction with six of the nine other variables. The coefficient of .667 indicates, as expected, that there is a strong positive correlation between mental ability and academic achievement. Probably there are factors other than innate mental ability that are being measured by the CTMM, such as reading skill and ability to work quickly and accurately, but, in any event, it is a strong predictor of academic success.

Of the remaining variables, value orientation has the highest correlation with achievement, and self concept, as measured by the CPI, also appears to have definite relationship to achievement. These two variables will be discussed at greater length later.

The moderate correlation of .294 between achievement and the vocational aspiration-expectation differential indicates that there was some tendency for better students to have greater differences between occupational desires and actual expectations than did poorer students. It will be noted that the coefficient of correlation between mental ability and vocational aspiration-expectation differential is almost identical to that between achievement and vocational aspiration-expectation. Possibly the Indian high school juniors and seniors of lower mental ability and academic standing are cognizant of their limitations and, therefore, do not aspire as high vocationally as do the more intelligent students of higher academic rank. Many capable Indian students, aware of their potential, may desire high ranking occupations, but, because of problems endemic to their minority group status and, possibly, because of cultural influences that bear upon them, they may be doubtful about ever making their aspirations an actuality.

Acculturation (Q) shows some positive correlation with achievement, indicating a definite but moderate relationship between the two. Apparently, degree of acculturation, as measured by the sum total of such characteristics as living off of a reservation, speaking English in the home, having a TV set, parents having a high school education, etc., has a positive relation to achievement, but is is not a highly potent factor. The factor of home language was isolated from other factors included in acculturation (Q) and its relationship to achievement was investigated. Findings from this analysis are presented later in this chapter.

Some positive correlation is indicated between mental ability and value orientation. It would appear that to some degree students of higher intelligence have internalized more of the values usually associated with the dominant culture than have students of lower intelligence.

A moderate and rather substantial positive correlation, as indicated by the coefficient of .373, exists between mental ability and acculturation (Q). The explanation may be that students from backgrounds indicative of greater acculturation simply do better on standardized tests, like the CTMM, than do students from less acculturated backgrounds which are generally conceded to produce educational disadvantage.

The coefficient of correlation of .259 between acculturation (Q) and vocation aspiration-expectation differential is indicative of a small but significant and definite relationship. It appears that the more acculturated students had greater differentials between occupational desires and occupational expectations than did less acculturated students. Perhaps students with a relatively high degree of acculturation have had more of the experiences that tend to raise occupational aspirations but are dubious of their chances of realizing them, while those of a lesser level of acculturation tend to expect and be satisfied with lower prestige occupations.

Other correlations showing significant relationships are interesting but not very enlightening, except perhaps as suggestions for further steps in analysis. For example, the correlation between acculturation (Q) and acculturation (SII) is moderately high and might be combined into one measure for further analyses. Substantial correlations between achievement motivation (AC) and achievement motivation (AI), and between self-concept (CPI) and achievement motivation (AC) were not unexpected. However, the almost zero correlation between self-concept (CPI) and self-concept (SD) was surprising, as were the low correlations between value orientation and the two acculturation variables.

Relationships of Value Orientation and Self-Concept to Academic Achievement

The relationships between value orientation and academic achievement, and between self-concept (CPI) and academic achievement were analyzed further, using a sample of all students for whom data had been gathered on all three variables. This raised the number of subjects to 1,664. Pearson product moment coefficients of correlation were computed, as presented in Table 39.

Table 39

COEFFICIENTS OF CORRELATION BETWEEN
ACADEMIC ACHIEVEMENT AND TWO OTHER VARIABLES

N	Value Orientation	Self-Concept (CPI)
1,664	.359*	.264*

*Significant at the .01 level.

As can be seen in Table 39 there was a coefficient of correlation of .359 between academic achievement and value orientation. This is somewhat higher than the coefficient of .314 appearing in the matrix constituting Table 78 which was computed on a smaller sample. The coefficient of .359 indicates a moderately high positive relationship between degree of orientation to values of the dominant culture and level of academic achievement.

A significant relationship, but of lesser magnitude, also was evident between self-concept (CPI) and achievement. The coefficient of correlation again was higher for the larger sample than that shown in Table 78. A coefficient of correlation of .264 suggests that strong positive feelings about self on the part of Indian students are reflected to a moderate degree in higher levels of achievement.

Academic Achievement and the Language of the Home

The relation between principal language of the home and academic achievement was explored. This was done by comparing home language of high achievers with home language of the entire sample.

An examination of individual achievement test scores registered by students in the fall of 1966, and in the fall of 1967 by all new students added to the sample at that time, revealed that only 349, or less than ten percent, scored at or above the 50th percentile. It was found that 189, or 54 percent, of these 349 high achievers came from homes in which English was spoken most of the time, while 160, or 46 percent, came from homes in which a native Indian language was predominant. For the sample as a whole, 33 percent came from English speaking homes and 67 percent from native speaking homes. Thus, if the home language pattern were the same for the high achievers as for the whole sample, it would be expected that only 33 percent of the 349 high achievers, or 115 instead of 189, would be from English speaking homes and 67 percent, or 234 instead of 160, would be from native speaking homes.

To test for significance in difference of home language between high achievers and the entire sample chi-square was employed. Actual and expected frequencies for high achievers are shown in Table 40.

Table 40

Actual and Expected Frequencies of Home Language of Indian High School Students Who Achieved at or above the 50th Percentile on the California Achievement Test

Fall 1966 and Fall 1967

Principal Language of the Home	Actual	Expected
English Language	189	115
Native Language	160	234
Total	349	349

Computation of chi-square yields an X^2 value of 63.307. This value is much greater than the 6.635 necessary for significance at the .01 level of confidence, and, in fact, is far beyond the value of 10.8 necessary for significance at the .001 level. Evidence clearly indicates that a significantly greater number of students from English speaking homes and fewer from native speaking homes were high achievers than the numbers of each in the whole sample would warrant. Apparently, there is a definite relationship between the language of the home and academic achievement.

VIII. SUMMARY AND CONCLUSIONS

Academic Achievement by Types of Schools

The primary concern of the study was to determine whether there were significant differences in academic achievement between Indian students in four types of high schools--federal on-reservation, federal off-reservation, public on-reservation, and public off-reservation. Using pretest and post-test scores gathered over a span of four years it was possible to assess achievement for four one-year periods, three two-year periods, two three-year periods, and one four-year period. When this was done by grades for each time period, using the California Achievement Test scores for reading, mathematics, language, and total battery, 104 categories of assessment resulted.

Controlling for initial individual differences in scholastic aptitude and academic ability, treatment of the data by analysis of covariance revealed that differences in achievement between the four school types, significant at or beyond the .05 level of confidence, had occurred for only 45 of 104, or less than one-half, of the categories. Significantly, no reliable differences in achievement between the four types of schools were found for the four-year period from the fall of 1966 to the spring of 1970. For the 45 categories for which significant achievement differences were registered, rankings were so variable that no hierarchal pattern, or evidence of particular superiority or inferiority, emerged.

In the light of the above findings it can confidently be concluded that when initial individual differences in scholastic aptitude and academic ability were controlled there was no evidence that academic achievement of

American Indian students was greater in one type of school than in another.

Academic Achievement by Areas

Differences in academic achievement of Indian students in the Aberdeen, Muskogee, Navajo, Phoenix, and Juneau areas were found to be significant at or beyond the .05 level of confidence for 71, or more than two-thirds, of the 104 categories of assessment.

Students in the Juneau area demonstrated a marked superiority in achievement, ranking first by wide margins for one-year, two year, three-year, and four-year analyses. Aberdeen ranked second for every time span. The other three areas varied in achievement rank for the various categories to the extent that no pattern of overall rank could be determined.

When initial individual differences in scholastic aptitude and academic ability were controlled, the evidence clearly established the academic superiority of the Juneau area, with Aberdeen a distant second, and no clear pattern of rank evident for the other three areas.

Academic Achievement by Grades

The data show that the academic achievement of Indian students is progressive from grade 9-12 but regressive when compared to national norms. Based upon California Achievement Total Battery mean scores, Indian students were one year retarded academically when entering ninth grade and more than two and one-half years retarded when about to graduate. In terms of percentiles, they ranked at the 27th percentile at the ninth grade level and at the 14th percentile at the twelfth grade level.

Scores were consistently highest in language and lowest in mathematics. However, the greatest regression in comparison to national norms occurred in reading. Ninth grade students ranked at the 34th percentile in reading and twelfth grade students at the 12th percentile.

Academic Achievement by Sexes

There were 21 comparative scores for boys and girls on reading, 21 on mathematics, and 21 on language. Boys scored slightly higher in 20 of the 21 reading cases. Boys scored higher than girls in all 21 cases in mathematics. Girls, on the other hand, scored higher than boys in every case in language.

The evidence clearly indicates a slight but reliable superiority of Indian boys over girls in reading, and a considerable superiority in mathematics. However, girls demonstrate a substantial superiority over boys in the mastery of English language skills.

Responses to Other Measurement Instruments

Responses to a number of self-report instruments yielded a variety of data which are the bases for certain conclusions.

A native language, rather than English, was the principal medium of oral communication used in the homes of two-thirds of the students. About 50% of the homes had television sets, but only 15% had telephones. Only 50% of the students' fathers and about 20% of the mothers were regularly employed. Less than 30% of the parents were high school graduates and about 60% had completed eighth grade. Families were comparatively large; three-fourths of the students' families numbered five or more.

In general, Indian students appeared to value education highly, like school, be greatly concerned about grades, have confidence in their scholastic ability, and respect their teachers. But they also indicated that school is skipped frequently and many gave evidence of being high dropout risks.

Indian students expressed optimism about the future and indicated that they have a healthy pride in racial and cultural heritage by rating INDIAN high among ten concepts, and much higher than WHITE MAN, on a semantic differential. The latter concept was given the lowest rating and MYSELF AS A PERSON the next lowest rating. However, since mean ratings of these two concepts were in the positive range, highly unfavorable attitudes toward self and the white man do not seem to be indicated.

Type and location of schools seemed to be factors related to certain student attitudes. Indian students attending schools in off-reservation settings registered greater optimism concerning their future than did on-reservation students. Those in the most integrated situations (public off-reservation schools) scored higher on measures of self-esteem than did those in the most segregated situations (federal on-reservation schools). Those in the segregated, federal schools indicated a greater regard for the Indian than did those in the integrated, public schools. Students attending schools located in the Indian-dominated society of the reservation registered a higher opinion of the white man than did those attending schools located in the off-reservation, anglo-dominated society.

Students in the Muskogee area had the highest opinion of the Indian of any of the five areas and the lowest opinion of the white man, while those in the Juneau area registered the highest opinion of the white man and the lowest opinion of the Indian. Muskogee area students scored highest on measures of self-esteem, but also registered the lowest opinion of teachers and the least interest in school. Juneau area students, on the other hand, evidenced the greatest interest in school and the highest regard for teachers and education. The students in the Phoenix area rated themselves lowest of the five areas on measures of self-esteem and of attitudes toward their present life, their future, their school success, education, and college.

The data indicate that students in the Aberdeen, Juneau, and Muskogee areas were more oriented to values of the dominant culture and possessed greater social presence than those in the Navajo and Phoenix areas. Also, students in public off-reservation schools rated highest and those in federal on-reservation schools lowest on value orientation and social presence. Significant gains on social presence and value orientation for each successive grade (10-12) suggest that the school has a socializing and acculturating effect upon Indian students.

There was an evident lack of information among Indian high school students about occupations, particularly about those in the higher prestige range. Also, vocational expectations were lower than vocational aspirations. Boys, more than girls, thought that they would be unable to obtain jobs of as high ranking as they desired.

Relationships Between Variables

Pearson product moment coefficients of correlation showed that mental ability, value orientation, self-concept as measured by three scales of the California Psychological Inventory, acculturation as measured by a questionnaire, and achievement motivation via conformance were significantly related to achievement. Mental ability was highly related to achievement, as was expected. There was a substantial positive relationship between orientation to the values of the dominant culture and achievement. The moderately high positive correlation between self-concept and achievement suggests that strong positive feelings about self are reflected to some degree in higher levels of achievement for Indian students. Acculturation and achievement motivation via conformance were reliably, but not highly correlated with achievement.

The proportion of Indian students from English speaking homes who were high achievers was significantly greater than from native speaking homes. Apparently, there is a definite relationship between the language of the home and academic achievement.

A differential between desired and expected occupations was obtained for Indian students and was found to have a significant positive correlation with achievement, as well as with mental ability and acculturation. It is hypothesized that Indian students scoring high on the latter three factors tend to have relatively high vocational aspirations but also tend not to raise their actual expectations correspondingly, possibly for reasons having to do with minority group status and cultural influences.

APPENDIX

APPENDIX A

Tables of Mean Scores of Criterion and Control Variables With Analyses of Covariance and Adjusted Criterion Means By School Types

Table A1

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TENTH GRADE STUDENTS BY SCHOOL TYPE 1966-67

School Type	N	CTMM IQ	Reading Post-test CAT Spring 1967	Reading Pre-test CAT Fall 1966	Mathematics Post-test CAT Spring 1967	Mathematics Pre-test CAT Fall 1966	Language Post-test CAT Spring 1967	Language Pre-test CAT Fall 1966	Total Battery Post-test CAT Spring 1967	Total Battery Pre-test CAT Fall 1966
1) Federal on-reservation	180	77	53.57	47.08	65.12	63.72	101.43	89.18	220.12	199.97
2) Federal off-reservation	204	81	53.07	48.64	67.11	62.88	99.88	90.05	220.06	201.57
3) Public on-reservation	218	84	56.68	51.39	70.18	69.01	107.92	98.25	234.78	218.65
4) Public off-reservation	120	90	59.92	54.95	71.97	70.38	109.08	100.07	240.97	225.40

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	719	58277			79801			93623			330203		
Within Groups	716	57597	80		78893	110		92649	129		327977	458	
Difference	3	680	226	**2.82	908	303	**2.75	974	324	***2.51	2226	742	***1.62

ADJUSTED CRITERION MEANS

School Type	Reading Post-test CAT	Reading Adjustment Value	Reading Adjusted Mean	Mathematics Post-test CAT	Mathematics Adjustment Value	Mathematics Adjusted Mean
1) Federal on-reservation	53.57	+3.44	57.01	65.12	+2.73	67.85
2) Federal off-reservation	53.07	+1.42	54.49	67.11	+3.03	70.14
3) Public on-reservation	56.68	-1.27	55.41	70.18	-2.62	67.56
4) Public off-reservation	59.92	-5.25	54.67	71.97	-4.48	67.49

**Significant at the .05 level.

***Not significant at the .05 level.

Table A2

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF ELEVENTH GRADE STUDENTS BY SCHOOL TYPE 1966-67

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1) Federal on-reservation	133	81	58.23	53.31	70.51	68.08	110.32	102.07	239.07	223.46
2) Federal off-reservation	140	80	60.11	55.93	72.96	69.64	107.12	95.84	240.19	221.40
3) Public on-reservation	165	81	58.50	54.22	73.95	72.44	109.98	101.55	242.42	228.21
4) Public off-reservation	87	82	58.70	55.09	68.55	69.13	107.52	99.13	234.77	223.34

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	522	47867			58481			65425			246943		
Within Groups	519	47746	92		57478	111		65162	126		243485	469	
Difference	3	121	40	*** .43	1003	334	** 3.01	263	88	*** .70	3458	1153	*** 2.46

ADJUSTED CRITERION MEANS

	Mathematics		
School Type	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	70.51	+1.70	72.21
2) Federal off-reservation	72.96	+0.47	73.43
3) Public on-reservation	73.95	-2.08	71.87
4) Public off-reservation	68.55	+0.59	69.14

**Significant at the .05 level.

***Not significant at the .05 level.

Table A3

MEAN SCORES OF CRITERION AND CONTROL VARIABLES
WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS
OF TWELFTH GRADE STUDENTS BY SCHOOL TYPE
1966-67

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1) Federal on-reservation	102	77	61.30	57.02	73.17	68.77	115.82	103.32	250.29	229.12
2) Federal off-reservation	138	80	64.56	59.91	77.31	71.13	112.11	99.90	253.98	230.94
3) Public on-reservation	122	85	65.96	63.25	78.80	78.66	115.22	110.70	259.98	252.60
4) Public off-reservation	101	85	66.31	62.50	79.20	77.62	115.83	110.62	261.34	250.74

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	460	45335			54900			58376			248386		
Within Groups	457	45058	99		52671	115		54101	118.4		231097	506	
Difference	3	277	92	.93***	2229	743	6.45*	4275	1425.1	12.04*	17289	5763	11.39*

ADJUSTED CRITERION MEANS

School Type	Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	73.17	+4.96	78.13	115.82	+2.71	118.53	250.29	+11.15	261.44
2) Federal off-reservation	77.31	+2.67	79.98	112.11	+4.59	116.70	253.98	+8.85	262.83
3) Public on-reservation	78.80	-4.36	74.44	115.22	-4.17	111.05	259.98	-11.40	248.58
4) Public off-reservation	79.20	-3.40	75.80	115.83	-3.97	111.86	261.34	-9.59	251.75

*Significant at the .01 level.
***Not significant at the .05 level.

Table A4

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF NINTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1) Federal on-reservation	244	81	47.8	43.5	62.6	54.0	93.7	87.9	204.0	185.3
2) Federal off-reservation	345	83	48.4	45.6	68.1	57.7	97.4	94.3	213.8	197.6
3) Public on-reservation	140	78	48.2	45.1	58.5	52.3	89.9	85.7	196.7	183.2
4) Public off-reservation	137	88	45.2	43.1	71.4	60.2	95.5	89.6	212.1	192.9

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	863	69362			752184			749809			2714938		
Within Groups	860	68450	80		749830	872		749441	871		2712440	3154	
Difference	3	912	304	3.82*	2354	785	0.90***	368	123	0.14***	2498	833	0.26***

ADJUSTED CRITERION MEANS

School Type	Reading		
	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	47.8	+0.9	48.7
2) Federal off-reservation	48.4	-0.9	47.5
3) Public on-reservation	48.2	+0.1	48.3
4) Public off-reservation	45.2	+0.3	45.5

*Significant at the .01 level.
***Not significant at the .05 level.

Table A5

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TENTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY SCHOOL TYPE

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1) Federal on-reservation	134	82	56.0	52.8	73.3	71.1	102.4	102.2	231.8	226.1
2) Federal off-reservation	124	78	50.4	47.3	69.3	62.8	96.9	98.7	216.5	208.7
3) Public on-reservation	64	88	58.9	56.2	76.3	73.9	105.5	102.3	240.7	232.4
4) Public off-reservation	108	90	57.4	53.0	74.9	72.5	106.6	102.3	238.9	227.7

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	427	35036			39870			43180			154632		
Within Groups	424	34985	82		38268	90		41378	98		153883	363	
Difference	3	51	17	*** 0.21	1602	534	* 5.9	1802	601	* 6.1	749	250	*** 0.69

ADJUSTED CRITERION MEANS

	Mathematics			Language		
School Type	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	73.3	-1.2	72.1	102.4	-0.6	101.8
2) Federal off-reservation	69.3	+6.8	76.1	96.9	+2.7	99.6
3) Public on-reservation	76.3	-4.5	71.8	105.5	-1.4	104.1
4) Public off-reservation	74.9	-3.6	71.3	106.6	-1.6	105.0

*Significant at the .01 level.
***Not significant at the .05 level.

Table A6

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF ELEVENTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY SCHOOL TYPE

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1) Federal on-reservation	110	78	57.9	54.9	76.4	72.2	105.1	103.4	239.4	230.5
2) Federal off-reservation	123	83	57.7	55.3	73.9	69.9	106.8	105.2	238.4	230.4
3) Public on-reservation	76	81	65.7	63.0	80.8	78.8	110.8	111.1	257.3	252.9
4) Public off-reservation	68	90	64.4	58.8	75.6	73.6	113.1	109.9	253.1	242.3

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	374	35477			50227			46231			168180		
Within Groups	371	35124	95		49896	134		46050	124		167247	451	
Difference	3	353	118	***1.2	331	110	***0.82	181	60	***0.48	933	311	***0.69

***Not significant at the .05 level.

ADJUSTED CRITERION MEANS

Since no significant F values were found, adjusted criterion means are not presented.

Table A7

MEAN SCORES OF CRITERION AND CONTROL VARIABLES
WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS
OF TWELFTH GRADE STUDENTS
FALL, 1967-SPRING, 1968, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1) Federal on-reservation	86	80	62.1	56.9	80.6	78.0	115.4	113.0	258.1	247.9
2) Federal off-reservation	67	81	66.8	64.0	79.3	77.5	111.0	112.0	257.1	253.3
3) Public on-reservation	48	84	64.5	63.3	80.7	75.2	118.1	114.5	263.3	253.0
4) Public off-reservation	54	83	63.5	61.6	81.7	77.9	112.7	111.1	257.9	250.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	252	25461			30435			24079			106258		
Within Groups	249	24945	100		30188	121		23386	94		104528	420	
Difference	3	516	172	***1.7	247	82	***0.68	693	231	***2.5	1730	577	***1.4

***Not significant at the .05 level.

ADJUSTED CRITERION MEANS

Since no significant F values were found, adjusted criterion means are not presented.

Table A8

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TENTH GRADE STUDENTS SPRING, 1968-SPRING, 1969, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968
1) Federal on-reservation	141	83	52.3	47.8	58.7	66.0	101.7	93.8	212.7	207.6
2) Federal off-reservation	224	87	56.4	49.1	67.0	70.3	106.9	99.2	230.2	218.6
3) Public on-reservation	166	92	57.5	49.6	69.3	66.8	104.5	95.5	231.3	211.9
4) Public off-reservation	131	90	55.3	47.0	70.4	71.9	103.4	97.7	229.0	216.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	659	60360			317218			169136			1026667		
Within Groups	656	59554	91		313707	478		166788	254		1018731	1553	
Difference	3	806	269	***2.96	3511	1170	***2.45	2348	783	**3.08	7936	2645	***1.70

ADJUSTED CRITERION MEANS

School Type	Language		
	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	101.7	+2.7	104.4
2) Federal off-reservation	106.9	+0.1	107.0
3) Public on-reservation	104.5	-1.4	103.1
4) Public off-reservation	103.4	-1.2	102.2

**Significant at the .05 level.
***Not significant at the .05 level.

Table A9

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF ELEVENTH GRADE STUDENTS SPRING, 1968-SPRING, 1969, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968
1) Federal on-reservation	101	82	59.0	55.5	72.7	74.7	109.0	102.4	240.7	232.6
2) Federal off-reservation	89	77	53.6	49.7	64.4	68.8	104.0	97.5	222.0	216.0
3) Public on-reservation	113	92	67.2	61.0	81.4	79.3	114.1	109.9	262.6	250.2
4) Public off-reservation	81	92	62.5	59.4	79.6	77.1	112.0	108.3	254.1	244.7

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	381	35527			36219			44921			134043		
Within Groups	378	34910	92		34091	90		43667	115		133388	353	
Difference	3	618	206	*** 2.23	2128	709	* 7.87	1254	418	** 3.62	655	218	*** 0.62

ADJUSTED CRITERION MEANS

School Type	Mathematics			Language		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	72.7	+0.8	73.5	109.0	+2.8	111.8
2) Federal off-reservation	64.4	+6.6	71.0	104.0	+8.0	112.0
3) Public on-reservation	81.4	-4.3	77.1	114.1	-5.7	108.4
4) Public off-reservation	79.6	-2.3	77.3	112.0	-4.3	107.7

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table A10

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TWELFTH GRADE STUDENTS SPRING, 1968-SPRING, 1969, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968
1) Federal on-reservation	78	78	60.7	58.5	76.4	77.0	112.6	106.2	249.7	241.7
2) Federal off-reservation	93	83	61.4	58.0	70.9	74.3	110.5	107.0	242.9	239.3
3) Public on-reservation	102	88	68.3	64.6	82.3	81.2	117.7	114.0	268.2	259.8
4) Public off-reservation	58	92	68.5	66.3	76.0	77.2	118.1	114.1	262.6	257.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	328	25795			42071			32915			143067		
Within Groups	325	25662	79		40525	125		32322	100		142952	440	
Difference	3	133	44	***0.56	1546	515	*4.12	593	198	***1.98	3085	1028	***2.34

ADJUSTED CRITERION MEANS

School Type	Mathematics		
	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	76.4	+2.0	78.4
2) Federal off-reservation	70.9	+3.0	73.9
3) Public on-reservation	82.3	-3.6	78.7
4) Public off-reservation	76.0	-1.3	74.7

*Significant at the .01 level.
***Not significant at the .05 level.

Table All

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE TENTH GRADE AND POST-TESTED IN ELEVENTH GRADE SPRING, 1969-SPRING, 1970, BY SCHOOL TYPE

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969
1) Federal on-reservation	97	83	54.4	53.1	63.3	59.0	105.6	100.9	223.3	213.0
2) Federal off-reservation	154	85	60.6	57.5	74.9	70.6	110.3	108.1	245.8	236.3
3) Public on-reservation	132	87	57.9	55.6	72.6	67.3	103.8	101.3	234.2	224.3
4) Public off-reservation	101	91	60.5	57.4	71.7	68.4	114.4	104.7	246.7	230.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	481	38600			52550			51070			179661		
Within Groups	478	38330	80		52194	109		47649	100		177687	372	
Difference	3	270	90	1.12***	356	119	1.09***	3421	1140	11.4*	1974	658	1.77***

ADJUSTED CRITERION MEANS

	Language		
School Type	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	105.6	+2.9	108.5
2) Federal off-reservation	110.3	-2.8	107.5
3) Public on-reservation	103.8	+2.0	105.8
4) Public off-reservation	114.4	-1.1	113.3

*Significant at the .01 level.
***Not significant at the .05 level.

Table A12

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE ELEVENTH GRADE AND POST-TESTED IN TWELFTH GRADE SPRING, 1969-SPRING, 1970, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969
1) Federal on-reservation	80	80	58.6	55.3	72.3	69.4	110.0	105.9	240.9	230.5
2) Federal off-reservation	88	79	57.2	55.3	69.7	64.7	106.7	105.4	233.6	225.4
3) Public on-reservation	95	88	66.0	61.6	81.5	75.8	113.8	110.3	261.2	247.7
4) Public off-reservation	90	93	66.6	64.7	86.6	82.0	117.4	112.6	270.6	259.3

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	350	28810			32865			34594			132452		
Within Groups	347	28257	81		32595	94		34023	98		131385	379	
Difference	3	553	184	***2.26	270	90	***0.96	571	190	***1.94	1067	356	***0.94

***Not significant at the .05 level.

ADJUSTED CRITERION MEANS

Since no significant F values were found, adjusted criterion means are not presented.

Table A13

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN TENTH GRADE FALL, 1966-SPRING, 1968, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966
1) Federal on-reservation	138	81	55.0	44.4	72.9	58.8	101.8	83.0	229.8	186.3
2) Federal off-reservation	122	78	50.3	42.3	69.5	55.7	96.7	83.4	216.5	181.3
3) Public on-reservation	121	89	57.4	48.8	75.5	64.6	107.0	92.2	239.9	205.5
4) Public off-reservation	115	90	58.1	49.1	73.5	62.0	105.4	90.5	237.0	201.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	493	48760			74757			67504			300845		
Within Groups	490	47574	97		72230	147		66020	135		287727	587	
Difference	3	1186	395	4.07*	2527	842	5.71*	1484	495	3.67**	13118	4373	7.45*

ADJUSTED CRITERION MEANS

School Type	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	55.0	+2.3	57.3	72.9	+2.0	74.9	101.8	+3.6	105.4	229.8	+8.3	238.1
2) Federal off-reservation	50.3	+5.4	55.7	69.5	+5.8	75.3	96.7	+4.5	101.2	216.5	+15.6	232.1
3) Public on-reservation	57.4	-3.9	53.5	75.5	-5.2	70.3	107.0	-4.9	102.1	239.9	-14.4	225.5
4) Public off-reservation	58.1	-4.3	53.8	73.5	-3.1	70.4	105.4	-4.0	101.4	237.0	-11.3	225.7

*Significant at the .01 level.
**Significant at the .05 level.

Table A14

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1966-SPRING, 1968, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966
1) Federal on-reservation	111	77	57.0	46.5	76.1	66.2	104.3	89.4	237.5	202.0
2) Federal off-reservation	122	82	57.5	49.1	73.4	62.9	106.7	90.9	237.6	202.9
3) Public on-reservation	129	87	63.1	53.1	78.3	70.8	112.1	98.9	253.5	222.8
4) Public off-reservation	62	90	65.0	55.6	77.3	70.1	116.6	101.1	258.9	226.8

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	421	39815			75324			55575			241133		
Within Groups	418	39148	94		74082	177		55376	132		237678	569	
Difference	3	667	222	***2.37	1242	414	***2.33	199	66	***0.50	3455	1152	***2.02

***Not significant at the .05 level.

ADJUSTED CRITERION MEANS

Since no significant F values were found, adjusted criterion means are not presented.

Table A15

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN ELEVENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1966-SPRING, 1968, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966
1) Federal on-reservation	86	79	62.2	51.9	79.6	66.8	114.8	101.5	256.7	220.2
2) Federal off-reservation	68	81	66.9	56.0	79.6	70.6	111.2	97.0	257.7	223.6
3) Public on-reservation	95	85	63.0	55.2	84.1	73.0	115.9	100.4	262.9	228.5
4) Public off-reservation	46	83	63.8	57.5	79.4	72.6	112.7	100.9	255.8	231.0

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	292	29619			48580			47435			183423		
Within Groups	289	28413	98		47468	164		47098	163		179264	620	
Difference	3	1206	402	4.09*	1112	371	2.26***	337	112	0.69***	4159	1386	2.23***

ADJUSTED CRITERION MEANS

School Type	Reading		
	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	62.2	+3.0	65.2
2) Federal off-reservation	66.9	-0.6	66.3
3) Public on-reservation	63.0	-1.2	61.8
4) Public off-reservation	63.8	-2.2	61.6

*Significant at the .01 level.
***Not significant at the .05 level.

Table A16

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE NINTH GRADE AND POST-TESTED IN TENTH GRADE FALL, 1967-SPRING, 1969, BY SCHOOL TYPE

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967
1) Federal on-reservation	163	81	51.5	43.1	57.3	53.7	100.1	87.5	209.1	184.3
2) Federal off-reservation	242	85	56.7	46.5	67.3	60.1	106.8	96.8	230.7	203.4
3) Public on-reservation	177	85	53.5	44.6	64.2	54.5	100.2	86.1	217.8	185.2
4) Public off-reservation	129	89	55.4	43.1	66.2	57.7	102.7	88.8	224.3	189.5

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	708	67167			97494			98104			424415		
Within Groups	705	66586	94		95124	135		98099	139		420594	597	
Difference	3	581	193	***2.05	2370	790	*5.85	5	2	***0.01	3821	1274	***2.13

ADJUSTED CRITERION MEANS

	Mathematics		
School Type	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	57.3	+3.7	61.0
2) Federal off-reservation	67.3	-3.0	64.3
3) Public on-reservation	64.2	+2.0	66.2
4) Public off-reservation	66.2	-1.8	64.4

*Significant at the .01 level.
***Not significant at the .05 level.

Table A17

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE TENTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1967-SPRING, 1969, BY SCHOOL TYPE

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967
1) Federal on-reservation	107	81	57.7	51.5	70.9	71.4	107.7	101.3	236.2	224.3
2) Federal off-reservation	105	76	52.4	46.4	62.1	61.5	102.9	97.7	217.4	205.5
3) Public on-reservation	108	89	63.6	54.6	77.9	72.5	110.8	101.9	252.3	228.9
4) Public off-reservation	107	90	61.7	53.9	76.8	72.3	110.9	103.0	249.4	229.2

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	424	38012			47713			51004			201430		
Within Groups	421	37845	90		45888	109		50876	121		196579	467	
Difference	3	167	56	*** 0.62	1825	608	* 5.58	128	43	*** 0.35	4851	1617	** 3.46

ADJUSTED CRITERION MEANS

	Mathematics			Total Battery		
School Type	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	70.9	-1.5	69.4	236.2	-0.8	235.4
2) Federal off-reservation	62.1	+8.1	70.2	217.4	+18.4	235.8
3) Public on-reservation	77.9	-3.3	74.6	252.3	-8.2	244.1
4) Public off-reservation	76.8	-3.2	73.6	249.4	-9.0	240.4

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table A18

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE ELEVENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1967-SPRING, 1969, BY SCHOOL TYPES

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967
1) Federal on-reservation	92	76	59.5	54.1	73.9	70.9	111.4	102.8	244.9	227.7
2) Federal off-reservation	114	82	60.6	54.3	70.1	68.9	110.0	104.6	240.7	227.8
3) Public on-reservation	94	86	65.5	58.6	79.4	75.6	114.9	110.0	259.8	244.2
4) Public off-reservation	74	91	67.8	59.0	75.3	74.1	117.4	110.6	260.5	243.7

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	371	32714			44521			39986			171962		
Within Groups	368	32649	89		43357	118		38886	106		169238	460	
Difference	3	65	22	***0.24	1164	388	**3.29	1100	367	**3.47	2724	908	***1.97

ADJUSTED CRITERION MEANS

School Type	Mathematics			Language		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	73.9	+2.5	76.4	111.4	+4.6	116.0
2) Federal off-reservation	70.1	+3.0	73.1	110.0	+1.8	111.8
3) Public on-reservation	79.4	-3.5	75.9	114.9	-3.0	111.9
4) Public off-reservation	75.3	-3.3	72.0	117.4	-4.8	112.6

**Significant at the .05 level.
***Not significant at the .05 level.

Table A19

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE NINTH GRADE AND POST-TESTED IN ELEVENTH GRADE SPRING, 1968-SPRING, 1970, BY SCHOOL TYPES

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968
1) Federal on-reservation	108	82	54.4	48.8	63.2	62.9	106.1	93.9	223.6	205.7
2) Federal off-reservation	159	86	60.0	49.0	73.7	71.5	109.9	100.6	243.5	221.1
3) Public on-reservation	118	89	59.0	48.5	74.6	67.1	105.7	94.9	239.2	210.4
4) Public off-reservation	99	91	60.4	48.4	73.4	67.4	114.1	93.1	245.0	209.0

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	481	48893			64804			66183			263900		
Within Groups	478	47787	100		62768	131		61510	129		252756	529	
Difference	3	1106	369	3.68**	2036	679	5.17*	4673	1558	12.10*	11144	3715	7.02*

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
School Type	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean
1) Federal on-reservation	54.4	+1.6	56.0	63.2	+5.3	68.5	106.1	+2.6	108.7	223.6	+9.3	232.9
2) Federal off-reservation	60.0	+0.1	60.1	73.7	-2.9	70.8	109.9	-2.4	107.5	243.5	-6.4	237.1
3) Public on-reservation	59.0	-0.5	58.5	74.6	-0.1	74.5	105.7	+0.2	105.9	239.2	+0.3	239.5
4) Public off-reservation	60.4	-1.3	59.1	73.4	-1.1	72.3	114.1	+0.7	114.8	245.0	-0.3	247.7

*Significant at the .01 level.
**Significant at the .05 level.

Table A20

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE TENTH GRADE AND POST-TESTED IN TWELFTH GRADE SPRING, 1968-SPRING, 1970, BY SCHOOL TYPES

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968
1) Federal on-reservation	76	81	60.1	53.5	73.7	70.8	109.7	99.6	243.5	223.9
2) Federal off-reservation	69	78	56.3	51.1	70.3	71.4	106.4	98.3	233.0	220.9
3) Public on-reservation	83	89	67.9	58.0	83.3	74.2	115.1	107.8	266.3	240.0
4) Public off-reservation	63	95	67.8	62.1	89.7	82.8	120.3	111.0	277.8	255.9

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	288	31398			29241			31530			119935		
Within Groups	285	30384	10		25435	89		31302	110		113923	400	
Difference	3	1014	338	** 3.17	3806	1269	* 14.22	228	76	*** 0.69	6012	2004	* 5.01

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Total Battery		
School Type	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	60.1	+3.5	63.6	73.7	+3.6	77.3	243.5	+11.1	254.6
2) Federal off-reservation	56.3	+6.4	62.7	70.3	+3.1	73.4	233.0	+14.6	247.6
3) Public on-reservation	67.9	-2.6	65.3	83.3	+0.1	83.4	266.3	-5.6	260.7
4) Public off-reservation	67.8	-7.8	60.0	89.7	-7.9	81.8	277.8	-22.0	255.8

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table A21

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE NINTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1966-SPRING, 1969, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966
1) Federal on-reservation	123	81	56.3	44.4	70.0	58.7	106.7	82.9	233.0	186.0
2) Federal off-reservation	131	78	53.8	41.9	64.1	55.7	103.5	81.7	221.3	179.3
3) Public on-reservation	137	87	60.9	47.2	74.0	61.5	108.1	89.9	243.0	198.6
4) Public off-reservation	124	91	61.8	49.1	76.6	64.9	110.0	91.9	248.4	205.9

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	512	62660			91661			93403			442604		
Within Groups	509	61989	122		91127	179		89861	177		435098	855	
Difference	3	671	224	***1.83	534	178	***0.99	3542	1181	*6.68	7506	2502	**2.92

ADJUSTED CRITERION MEANS

School Type						
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	106.7	+3.7	110.4	233.0	+8.6	241.6
2) Federal off-reservation	103.5	+5.7	109.2	221.3	+17.2	238.5
3) Public on-reservation	108.1	-3.4	104.7	243.0	-8.4	234.6
4) Public off-reservation	110.0	-6.0	104.0	248.4	-17.5	230.9

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table A22

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1966-SPRING, 1969, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966
1) Federal on-reservation	107	77	59.5	46.6	72.3	64.0	109.8	89.6	241.7	200.2
2) Federal off-reservation	127	82	60.7	48.9	69.3	63.4	109.9	90.7	239.9	203.0
3) Public on-reservation	114	85	64.5	51.0	77.2	69.8	114.4	98.2	256.1	219.0
4) Public off-reservation	85	90	68.2	54.5	77.4	71.2	117.3	101.7	262.9	227.4

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	430	43957			62423			53380			227112		
Within Groups	427	43599	102		61488	144		52448	123		222007	520	
Difference	3	358	119	***1.17	935	312	***2.16	932	311	***2.53	5105	1702	**3.27

ADJUSTED CRITERION MEANS

School Type	Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	241.7	+13.1	254.8
2) Federal off-reservation	239.9	+8.5	248.4
3) Public on-reservation	256.1	-8.2	247.9
4) Public off-reservation	262.9	-18.4	244.5

**Significant at the .05 level.
***Not significant at the .05 level.

Table A23

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE NINTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1967-SPRING, 1970, BY SCHOOL TYPE

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967
1) Federal on-reservation	119	82	54.0	44.3	62.7	55.0	105.6	89.2	222.3	188.4
2) Federal off-reservation	182	86	60.1	46.1	73.8	61.5	109.7	98.7	243.7	206.2
3) Public on-reservation	145	87	57.7	45.1	71.3	57.3	103.6	87.8	232.6	190.4
4) Public off-reservation	96	92	61.3	45.4	71.2	59.1	113.2	90.7	245.8	195.3

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	539	69081			84303			79697			374542		
Within Groups	536	67953	127		82285	154		76450	143		368827	688	
Difference	3	1128	376	2.96**	2018	673	4.38*	3247	1082	7.58*	5715	1905	2.76**

ADJUSTED CRITERION MEANS

School Type	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	54.0	+2.3	56.3	62.7	+4.4	67.1	105.6	+3.0	108.6	222.3	+9.7	232.0
2) Federal off-reservation	60.1	-0.2	59.9	73.8	-2.6	71.2	109.7	-3.7	106.0	243.7	-8.2	235.5
3) Public on-reservation	57.7	-0.3	57.4	71.3	+0.9	72.2	103.6	+2.5	106.1	232.6	+4.4	237.0
4) Public off-reservation	61.3	-2.0	59.3	71.2	-2.0	69.2	113.2	-0.5	112.7	245.8	-3.2	242.6

*Significant at the .01 level.
**Significant at the .05 level.

Table A24

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1967-SPRING, 1970, BY SCHOOL TYPE

			Reading		Mathematics		Language		Total Battery	
School Type	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967
1) Federal on-reservation	85	80	58.7	49.9	71.8	67.7	109.6	99.3	240.1	216.8
2) Federal off-reservation	79	78	55.3	46.6	68.6	64.4	106.0	99.6	229.8	210.5
3) Public on-reservation	89	89	67.2	54.9	82.4	72.6	114.4	102.9	264.0	230.4
4) Public off-reservation	78	93	66.9	56.2	86.8	77.0	118.6	103.9	272.2	237.1

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	328	37084			37898			39656			177760		
Within Groups	325	36750	113		35855	110		37753	116		169309	521	
Difference	3	334	111	0.98***	2043	681	6.17*	1903	634	5.46*	8451	2817	5.40*

ADJUSTED CRITERION MEANS

School Type	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1) Federal on-reservation	71.8	+2.9	74.7	109.6	+2.2	111.8	240.1	+7.8	247.9
2) Federal off-reservation	68.6	+6.1	74.7	106.0	+2.3	108.3	229.8	+14.6	244.4
3) Public on-reservation	82.4	-2.3	80.1	114.4	-1.6	112.8	264.0	-7.4	256.6
4) Public off-reservation	86.8	-6.7	80.1	118.6	-2.9	115.7	272.2	-14.8	257.4

*Significant at the .01 level.

***Not significant at the .05 level.

Table A25

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN THE NINTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1966-SPRING, 1970, BY SCHOOL TYPES

School Type	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1970	Pre-test CAT Fall 1966	Post-test CAT Spring 1970	Pre-test CAT Fall 1966	Post-test CAT Spring 1970	Pre-test CAT Fall 1966	Post-test CAT Spring 1970	Pre-test CAT Fall 1966
1) Federal on-reservation	99	80	58.9	44.9	71.8	58.3	109.4	82.6	240.1	185.8
2) Federal off-reservation	109	78	55.4	41.8	69.2	55.5	104.1	80.8	228.7	178.1
3) Public on-reservation	106	88	65.6	47.7	80.7	63.6	112.7	92.7	259.0	204.0
4) Public off-reservation	107	93	66.8	50.1	87.3	68.4	117.5	93.7	271.6	212.2

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	418	62529			80500			79219			402590		
Within Groups	415	61733	149		79652	192		77754	187		401834	968	
Difference	3	796	265	***1.78	848	283	***1.47	1465	488	***2.60	756	252	***0.26

ADJUSTED CRITERION MEANS

Since no significant F scores were found, adjusted criterion means are not presented.

***Not significant at the .05 level.

APPENDIX B

Tables of Mean Scores of Criterion and Control Variables With Analysis of Covariance and Adjusted Criterion Means By Areas

Table B1

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TENTH GRADE STUDENTS FALL, 1966-SPRING, 1967, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1. Aberdeen	171	89	60.54	55.68	72.29	69.85	107.40	95.67	240.33	221.21
2. Muskogee	34	88	57.62	52.59	66.29	65.91	108.82	99.47	232.74	217.97
3. Navajo	332	78	51.53	46.42	64.23	63.75	100.52	92.43	216.28	202.61
4. Phoenix	157	82	55.60	50.45	70.75	66.05	105.78	95.10	232.12	211.60
5. Juneau	28	87	66.04	55.39	82.11	73.79	114.46	88.86	262.61	218.04

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	719	58277			79801			93623			330191		
Within Groups	715	57251	80		76455	107		87772	122.8		303547	424.5	
Difference	4	1026	256	3.20**	3346	837	7.82*	5851	1463	11.91*	26644	6661	15.69*

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	60.64	-5.60	55.04	72.29	-3.88	68.41	107.40	-2.42	104.98	240.33	-11.48	228.85
2. Muskogee	57.62	-3.20	54.42	66.29	-0.41	65.88	108.82	-4.83	103.99	232.74	-8.45	224.29
3. Navajo	51.53	+3.63	55.16	64.23	+2.54	66.77	100.52	+1.81	102.33	216.28	+7.86	224.14
4. Phoenix	55.60	-0.03	55.57	70.75	+0.20	70.95	105.78	-0.63	105.15	232.12	-0.84	231.28
5. Juneau	66.04	-4.80	61.24	82.11	-6.99	75.12	114.46	+2.65	117.11	262.61	-8.03	254.58

*Significant at the .01 level.
**Significant at the .05 level.

Table B2

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF ELEVENTH GRADE STUDENTS FALL, 1966-SPRING, 1967, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1. Aberdeen	126	85	61.90	59.17	72.31	70.80	112.71	101.18	246.91	231.16
2. Muskogee	22	82	61.86	57.77	66.27	69.55	109.14	101.32	237.27	228.64
3. Navajo	269	79	55.58	51.83	70.20	69.33	106.47	99.48	232.25	220.65
4. Phoenix	88	80	58.33	52.22	71.59	66.47	105.60	96.49	235.52	215.17
5. Juneau	20	93	83.75	69.75	100.30	90.95	131.75	107.15	315.80	267.85

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	522	47867			58481			65424			246916		
Within Groups	518	44371	85.6		55342	107		60002	116		216607	418	
Difference	4	3496	873.9	10.20*	3139	785	7.34*	5422	1356	11.70*	30309	7577	18.12*

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean
1. Aberdeen	61.90	-3.81	58.09	72.31	-1.23	71.08	112.71	-1.98	110.73	246.91	-7.15	239.76
2. Muskogee	61.86	-2.11	59.75	66.27	+0.32	66.59	109.14	-1.12	108.02	237.27	-3.69	233.58
3. Navajo	55.58	+2.29	57.87	70.20	+0.94	71.14	106.47	+0.85	107.32	232.25	+4.03	236.28
4. Phoenix	58.33	+1.80	60.13	71.59	+3.23	74.82	105.60	+2.33	107.93	235.52	+7.95	243.47
5. Juneau	83.75	-12.45	71.30	100.30	-19.56	80.74	131.75	-7.95	123.80	315.80	-40.13	275.67

*Significant at the .01 level.

Table B3

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TWELFTH GRADE STUDENTS
FALL, 1966-SPRING, 1967, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966	Post-test CAT Spring 1967	Pre-test CAT Fall 1966
1. Aberdeen	103	91	74.29	69.28	84.91	80.29	121.32	109.18	280.52	258.76
2. Muskogee	23	86	68.57	68.48	71.04	72.57	122.30	117.96	261.91	259.00
3. Navajo	231	78	58.07	56.23	72.19	70.64	110.09	105.43	240.35	232.31
4. Phoenix	83	77	63.60	55.60	74.35	68.31	112.14	98.28	250.10	222.19
5. Juneau	23	90	86.22	78.09	109.52	101.74	130.13	110.09	325.87	289.91

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	460	45335			54900			58376			248402		
Within Groups	456	40600	89		51268	112.5		50466	110.6		201462	442	
Difference	4	4735	1184	13.30*	3632	908	8.08*	7910	1977	17.87*	46940	11735	26.56*

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	74.29	-7.62	66.67	84.91	-6.01	78.90	121.32	-3.62	117.70	280.52	-17.14	263.38
2. Muskogee	68.57	-5.90	62.67	71.04	+0.90	71.94	122.30	-9.29	113.01	261.91	-16.31	245.60
3. Navajo	58.07	+3.73	61.80	72.19	+3.12	75.31	110.09	+0.78	110.87	240.35	+ 7.69	248.04
4. Phoenix	63.60	+4.29	67.89	74.35	+5.14	79.49	112.14	+6.04	118.18	250.10	+16.34	266.44
5. Juneau	86.22	-12.93	73.29	109.52	-23.92	85.60	130.13	-4.08	126.05	325.87	-43.09	282.78

*Significant at the .01 level.

Table B4

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF NINTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1. Aberdeen	237	82	49.2	45.3	64.9	56.7	94.9	88.7	209.0	190.6
2. Muskogee	71	91	52.5	49.5	66.1	57.8	97.8	98.2	216.4	205.5
3. Navajo	361	80	46.0	43.0	63.7	53.9	94.0	89.0	203.8	185.9
4. Phoenix	124	81	43.0	40.7	59.2	51.0	88.6	87.0	190.7	178.6
5. Juneau	73	86	54.3	51.4	86.6	72.8	106.3	100.9	247.2	225.1

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	863	69362			752184			749810			2717171		
Within Groups	859	68673	80		748792	872		745665	868		2703273	3147	
Difference	4	689	172	*** 2.1	3392	848	*** 0.97	4145	1036	*** 1.2	13898	3474	*** 1.1

*** Not significant at the .05 level.

ADJUSTED CRITERION MEANS

Since no significant F values were found, adjusted criterion means are not presented.

Table B5

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TENTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1. Aberdeen	115	92	66.4	62.1	81.6	77.0	108.8	105.9	256.8	245.0
2. Muskogee	12	88	53.2	48.8	72.3	62.3	102.9	101.7	228.3	212.7
3. Navajo	180	79	49.4	46.5	68.0	65.9	99.5	98.2	216.9	210.6
4. Phoenix	97	82	50.3	48.1	67.6	63.8	97.9	99.0	215.7	210.9
5. Juneau	26	90	64.8	57.5	90.1	85.0	109.6	109.8	264.5	252.3

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	472	35036			39871			43180			154603		
Within Groups	423	33893	80		38997	92		42328	100		150528	356	
Difference	4	1143	286	3.56*	874	218	2.37***	852	213	2.13***	4075	1019	2.86**

ADJUSTED CRITERION MEANS

Area	Reading			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	66.4	-9.3	57.1	256.8	-22.5	234.3
2. Muskogee	53.2	+1.7	54.9	228.3	+7.7	236.0
3. Navajo	49.4	+4.9	54.3	216.9	+12.1	229.0
4. Phoenix	50.3	+3.2	53.5	215.7	+11.0	226.7
5. Juneau	64.8	-5.4	59.4	264.5	-28.7	235.8

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table B6

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF ELEVENTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1. Aberdeen	99	87	71.0	65.3	80.3	77.2	115.3	111.7	266.6	254.2
2. Muskogee	21	93	63.8	58.4	70.0	68.0	108.6	111.1	242.3	237.6
3. Navajo	129	77	53.1	50.8	72.9	69.3	101.7	100.1	227.7	220.2
4. Phoenix	99	82	58.4	56.0	76.4	72.8	108.2	107.9	243.0	236.6
5. Juneau	29	85	63.4	63.6	82.0	79.9	113.3	112.0	258.8	255.5

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	374	35477			50227			46231			168182		
Within Groups	370	33972	92		50100	135		44990	122		164464	444	
Difference	4	1505	376	4.09*	127	32	0.23***	1241	310	2.55**	3718	929	2.09***

ADJUSTED CRITERION MEANS

	Reading			Language		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	71.0	-7.2	63.8	115.3	-4.4	110.9
2. Muskogee	63.8	-1.9	61.9	108.6	-4.9	103.7
3. Navajo	53.1	+6.2	59.3	101.7	+5.8	107.5
4. Phoenix	58.4	+1.2	59.6	108.2	-0.7	107.5
5. Juneau	63.4	-5.6	57.8	113.3	-4.4	108.9

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table B7

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TWELFTH GRADE STUDENTS FALL, 1967-SPRING, 1968, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967	Post-test CAT Spring 1968	Pre-test CAT Fall 1967
1. Aberdeen	61	84	69.4	63.2	81.0	75.1	117.1	113.6	267.4	251.9
2. Muskogee	11	85	63.2	60.3	69.6	69.1	107.5	112.8	240.4	242.2
3. Navajo	99	80	60.7	57.1	79.2	77.3	114.1	111.9	254.0	246.3
4. Phoenix	62	80	61.3	60.7	78.8	76.8	111.5	111.1	251.6	248.6
5. Juneau	22	83	73.0	73.3	95.6	89.0	117.5	117.0	286.1	279.2

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	252	25461			30435			24079			106258		
Within Groups	248	24495	99		29293	118		23153	93		100534	405	
Difference	4	966	242	2.45**	1142	286	2.42**	926	231	2.48**	5724	1431	3.53*

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	69.4	-2.3	67.1	81.0	+1.5	82.5	117.1	-1.3	115.8	267.4	-1.8	265.6
2. Muskogee	63.2	+0.1	63.3	69.6	+6.6	76.2	107.5	-0.8	106.7	240.4	+6.7	247.1
3. Navajo	60.7	+3.4	64.1	79.2	+0.2	79.4	114.1	+0.9	115.0	254.0	+4.7	258.7
4. Phoenix	61.3	+0.4	61.7	78.8	+0.5	79.3	111.5	+1.5	113.0	251.6	+2.4	254.0
5. Juneau	73.0	-10.5	62.5	95.6	-10.2	85.4	117.5	-4.1	113.4	286.1	-26.3	259.8

*Significant at the .01 level.
**Significant at the .05 level.

Table B8

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TENTH GRADE STUDENTS SPRING, 1968-SPRING, 1969, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968
1. Aberdeen	169	91	58.6	52.5	68.3	69.5	106.8	98.0	233.7	220.0
2. Muskogee	77	90	57.5	50.4	62.8	67.1	103.7	96.2	224.0	213.7
3. Navajo	277	87	52.8	45.6	66.0	67.9	103.0	96.1	221.8	209.6
4. Phoenix	86	84	51.8	44.4	60.9	61.6	98.5	91.2	211.2	197.2
5. Juneau	53	88	63.5	55.2	77.4	86.0	116.1	106.8	257.0	248.0

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	659	60360			317218			169136			1026667		
Within Groups	655	59943	91		312796	477		162423	248		999122	1525	
Difference	4	417	104	1.14***	4422	1105	2.31***	6713	1678	6.77*	27545	6886	4.51*

ADJUSTED CRITERION MEANS

	Language			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	106.8	-1.5	105.3	233.7	-5.8	227.9
2. Muskogee	103.7	-0.6	103.1	224.0	-2.1	221.9
3. Navajo	103.0	+0.7	103.7	221.8	+3.0	224.8
4. Phoenix	98.5	+2.4	100.9	211.2	+9.5	220.7
5. Juneau	116.1	-1.7	114.4	257.0	-9.9	247.1

*Significant at the .01 level.
***Not significant at the .05 level.

Table B9

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF ELEVENTH GRADE STUDENTS
SPRING, 1968-SPRING, 1969, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968
1. Aberdeen	102	97	76.1	69.8	86.7	87.6	121.7	113.4	284.6	270.8
2. Muskogee	9	86	57.8	52.4	67.8	69.0	111.9	101.6	237.4	223.0
3. Navajo	170	80	53.9	50.4	70.2	69.6	104.1	101.8	228.2	221.8
4. Phoenix	81	82	55.4	51.2	67.2	68.0	104.6	98.8	227.1	218.0
5. Juneau	22	90	65.3	64.6	86.1	89.4	120.2	110.4	271.6	264.4

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	381	35527			36219			44921			134043		
Within Groups	377	34706	92		35772	95		42323	112		132382	351	
Difference	4	821	205	***2.23	447	112	***1.18	2598	649	5.79*	1661	415	***1.18

ADJUSTED CRITERION MEANS

	Language		
Area	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	121.7	-8.5	113.2
2. Muskogee	111.9	+2.4	114.3
3. Navajo	104.1	+3.2	107.3
4. Phoenix	104.6	+5.2	109.8
5. Juneau	120.2	-5.2	115.0

*Significant at the .01 level.
***Not significant at the .05 level.

Table B10

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF TWELFTH GRADE STUDENTS SPRING, 1968-SPRING, 1969, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total battery	
			Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968	Post-test CAT Spring 1969	Pre-test CAT Spring 1968
1. Aberdeen	77	95	77.7	75.2	82.9	83.9	123.6	118.9	284.1	278.1
2. Muskogee	20	86	68.7	62.7	66.8	69.7	114.5	109.0	249.9	241.4
3. Navajo	131	79	57.4	54.1	75.0	74.0	109.2	105.6	241.6	233.8
4. Phoenix	85	84	61.9	60.2	74.9	78.4	114.4	109.6	251.1	248.2
5. Juneau	18	87	69.6	63.1	80.5	81.0	116.0	110.5	266.1	254.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	328	25785			42071			32915			146037		
Within Groups	324	25182	78		40520	125		32674	101		144502	446	
Difference	4	613	153	***1.97	1551	388	**3.10	241	60	***0.59	1535	384	***0.86

ADJUSTED CRITERION MEANS

Area	Mathematics		
	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	82.9	-7.3	75.6
2. Muskogee	66.8	+5.5	72.3
3. Navajo	75.0	+4.1	79.1
4. Phoenix	74.9	-0.4	74.5
5. Juneau	80.5	-3.2	77.3

**Significant at the .05 level.
***Not significant at the .05 level.

Table B11

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN ELEVENTH GRADE SPRING, 1969-SPRING, 1970, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969
1. Aberdeen	104	91	63.4	60.8	74.4	70.2	109.1	108.6	246.9	239.6
2. Muskogee	60	91	61.1	57.6	72.6	66.4	111.6	105.7	245.3	229.7
3. Navajo	211	84	55.2	52.9	69.2	65.5	106.8	101.5	231.2	219.8
4. Phoenix	70	85	53.4	52.0	65.4	61.2	103.4	97.8	222.2	211.0
5. Juneau	39	88	69.8	65.6	82.2	77.5	120.0	115.4	272.0	258.4

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	481	38598			52549			51069			179677		
Within Groups	477	38147	80		52295	110		49313	103		176099	369	
Difference	4	451	113	*** 1.41	254	63	*** 0.57	1756	439	* 4.24	3578	894	** 2.42

ADJUSTED CRITERION MEANS

	Language			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	109.1	-4.0	105.1	246.9	-12.7	234.2
2. Muskogee	111.6	-1.9	109.7	245.3	-3.8	241.5
3. Navajo	106.8	+2.4	109.2	231.2	+7.6	238.8
4. Phoenix	103.4	+5.0	108.4	222.2	+15.2	237.4
5. Juneau	120.0	-8.4	111.6	272.0	-28.3	243.7

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table B12

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN ELEVENTH GRADE AND POST-TESTED IN TWELFTH GRADE SPRING, 1969-SPRING, 1970, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969	Post-test CAT Spring 1970	Pre-test CAT Spring 1969
1. Aberdeen	58	96	79.9	74.5	86.6	82.8	118.1	118.7	284.6	276.0
2. Muskogee	16	86	61.1	62.3	76.1	70.2	113.7	112.4	251.9	244.8
3. Navajo	175	81	56.5	53.5	73.8	69.8	109.5	104.1	239.8	227.3
4. Phoenix	79	84	58.9	57.5	76.7	70.3	109.9	106.9	245.5	234.7
5. Juneau	25	91	72.5	69.6	89.6	85.2	122.0	121.0	284.0	275.8

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	350	28810			32865			34593			132455		
Within Groups	346	28078	81		32577	94		33440	97		131356	380	
Difference	4	732	183	***2.25	288	72	***0.76	1153	288	**2.98	1099	275	***0.72

ADJUSTED CRITERION MEANS

	Language		
Area	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	118.1	-9.6	108.5
2. Muskogee	113.7	-3.0	110.7
3. Navajo	109.5	+4.3	113.8
4. Phoenix	109.9	+1.5	111.4
5. Juneau	122.0	-10.4	111.6

**Significant at the .05 level.
***Not significant at the .05 level.

Table B13

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN TENTH GRADE FALL, 1966-SPRING, 1968, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966
1. Aberdeen	137	93	65.7	53.3	80.9	66.9	107.0	90.6	253.6	210.8
2. Muskogee	11	86	53.0	43.9	74.5	61.1	102.7	84.9	230.3	189.9
3. Navajo	221	80	50.2	42.4	68.8	57.4	101.6	85.9	220.6	185.8
4. Phoenix	104	81	50.1	43.7	66.8	55.8	97.4	86.1	214.3	185.7
5. Juneau	18	90	68.1	50.1	96.1	69.0	114.1	81.8	278.2	200.9

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	405	48762			74759			67504			300835		
Within Groups	401	46382	95		70769	145		62540	128		268300	549	
Difference	4	2380	595	6.27*	3990	997	6.89*	4964	1241	9.70*	32535	8134	14.82*

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	65.7	-8.3	57.4	80.9	-7.7	73.2	107.0	-4.8	102.2	253.6	-20.4	233.2
2. Muskogee	53.0	+1.1	54.1	74.5	-1.2	73.3	102.7	+0.9	103.6	230.3	+1.9	232.2
3. Navajo	50.2	+4.1	54.3	68.8	+3.3	72.1	101.6	+2.0	103.6	220.6	+9.1	229.7
4. Phoenix	50.1	+2.8	52.9	66.8	+4.5	71.3	97.4	+1.5	98.9	214.3	+8.6	222.9
5. Juneau	68.1	-4.8	63.3	96.1	-8.9	87.2	114.1	+2.1	116.2	278.2	-9.7	268.5

*Significant at the .01 level.

Table B14

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1966-SPRING, 1968, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966
1. Aberdeen	106	91	69.6	57.4	79.7	72.4	114.3	97.8	263.7	227.7
2. Muskogee	23	87	62.6	51.2	70.0	67.1	109.0	101.1	240.6	219.5
3. Navajo	169	79	54.3	46.1	74.0	65.5	105.0	91.9	233.4	203.5
4. Phoenix	106	81	57.9	49.4	75.9	64.0	108.3	94.5	242.2	207.9
5. Juneau	20	87	68.3	57.0	85.5	71.0	121.5	90.3	275.2	218.3

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	345	39815			75326			55579			241136		
Within Groups	341	39244	94		72007	173		50177	120		225210	540	
Difference	4	571	143	1.51***	3319	830	4.80*	5402	1350	11.22*	15926	3981	7.37*

ADJUSTED CRITERION MEANS

Area	Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	79.7	-5.8	73.9	114.4	-3.8	110.6	263.7	-16.7	247.0
2. Muskogee	69.0	-0.5	68.5	109.0	-5.3	103.7	240.6	-7.9	232.7
3. Navajo	74.0	+2.2	76.2	105.0	+2.6	107.6	233.4	+9.4	242.8
4. Phoenix	75.9	+3.2	79.1	108.3	+0.4	108.7	242.2	+4.6	246.8
5. Juneau	85.5	-3.9	81.6	121.5	+2.2	123.7	275.2	-6.7	268.5

*Significant at the .01 level.

***Not significant at the .05 level.

Table B15

MEAN SCORES OF CRITERION AND CONTROL VARIABLES
WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS
OF STUDENTS PRETESTED IN ELEVENTH GRADE
AND POST-TESTED IN TWELFTH GRADE
FALL, 1966-SPRING, 1968, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966	Post-test CAT Spring 1968	Pre-test CAT Fall 1966
1. Aberdeen	73	86	69.4	60.2	81.9	74.1	115.2	101.0	266.5	235.2
2. Muskogee	11	82	62.8	55.9	70.7	69.6	106.6	99.5	239.8	224.9
3. Navajo	134	80	60.1	52.0	80.2	69.1	113.8	99.9	254.0	220.9
4. Phoenix	64	80	61.3	52.3	78.8	66.2	110.8	98.0	250.9	216.4
5. Juneau	13	89	83.3	64.5	105.0	88.8	131.6	106.3	319.9	259.5

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	292	29620			48582			47434			183433		
Within Groups	288	28113	98		45940	159		44903	156		168496	585	
Difference	4	1507	377	3.85*	2642	660	4.14*	2531	633	4.05*	14937	3734	6.38*

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
Area	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean
1. Aberdeen	69.4	-5.1	64.3	81.9	-3.7	78.2	115.2	-1.6	113.6	266.5	-10.2	256.3
2. Muskogee	62.8	-0.8	62.0	70.4	+0.8	71.2	106.6	+0.3	106.9	239.8	-0.4	240.2
3. Navajo	60.1	+2.6	62.7	80.2	+1.6	81.8	113.8	+0.5	114.3	254.0	+4.6	258.6
4. Phoenix	61.3	+2.4	63.7	78.8	+4.0	82.8	110.8	+1.7	112.5	250.9	+8.5	259.4
5. Juneau	83.3	-9.4	73.9	105.0	-16.5	88.5	131.6	-5.7	125.9	319.9	-32.2	287.7

*Significant at the .01 level.

Table B16

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN TENTH GRADE FALL, 1967-SPRING, 1969, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967
1. Aberdeen	166	88	57.4	47.2	66.6	59.1	106.5	91.6	230.5	197.9
2. Muskogee	60	92	58.2	49.4	62.6	59.1	102.3	96.9	223.1	205.4
3. Navajo	318	82	51.2	41.9	61.8	54.3	100.0	87.4	212.9	183.6
4. Phoenix	89	83	51.4	42.2	59.7	52.5	97.3	87.2	208.5	181.8
5. Juneau	78	88	62.3	49.2	73.7	65.7	113.9	99.8	249.9	214.7

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	708	67167			97493			98095			424441		
Within Groups	704	65763	93		95324	135		92427	131		405625	576	
Difference	4	1404	351	3.75*	2169	542	4.00*	5668	1417	10.79*	18816	4704	8.16*

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	57.4	-2.6	54.8	66.6	-2.8	63.8	106.5	-1.4	105.1	230.5	-6.8	223.7
2. Muskogee	58.2	-5.4	52.8	62.6	-4.2	58.4	102.3	-5.8	96.5	223.1	-16.0	207.1
3. Navajo	51.2	+2.7	53.9	61.8	+3.1	64.9	100.0	+2.7	102.7	212.9	+8.9	221.8
4. Phoenix	51.4	+2.3	53.7	59.7	+4.4	64.2	97.3	+2.6	99.9	208.5	+9.7	218.2
5. Juneau	62.3	-4.1	58.2	73.7	-8.6	65.1	113.9	-6.5	107.4	249.9	-20.5	229.4

*Significant at the .01 level.

Table B17

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1967-SPRING, 1969, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967
1. Aberdeen	92	95	71.8	64.0	81.3	79.9	118.5	107.9	271.5	251.8
2. Muskogee	12	86	58.3	49.0	66.3	63.2	112.0	101.4	236.6	213.6
3. Navajo	207	80	53.5	46.9	68.8	66.2	102.8	97.7	225.2	210.8
4. Phoenix	79	82	55.2	47.7	66.8	64.7	104.8	99.3	226.8	211.7
5. Juneau	37	87	64.2	56.6	79.3	74.0	117.9	105.3	261.9	235.9

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	424	38013			47712			51003			201412		
Within Groups	420	37943	90		47028	112		47940	114		197587	470	
Difference	4	70	17	*** 0.19	684	171	*** 1.52	3063	766	* 6.71	3825	956	*** 2.03

ADJUSTED CRITERION MEANS

Area	Language		
	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	118.5	-7.4	111.1
2. Muskogee	112.0	-0.6	111.4
3. Navajo	102.8	+3.3	106.1
4. Phoenix	104.8	+1.7	106.5
5. Juneau	117.9	-3.7	114.2

*Significant at the .01 level.
***Not significant at the .05 level.

Table B18

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN ELEVENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1967-SPRING, 1969, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967	Post-test CAT Spring 1969	Pre-test CAT Fall 1967
1. Aberdeen	71	92	74.2	65.7	80.1	76.7	121.9	112.6	276.2	255.0
2. Muskogee	22	92	70.6	58.9	68.2	71.0	115.9	112.5	254.7	242.3
3. Navajo	162	78	56.8	51.0	72.0	68.4	108.2	101.6	237.0	221.0
4. Phoenix	87	83	60.8	55.9	73.2	72.9	112.3	108.1	246.2	236.9
5. Juneau	32	88	70.5	61.0	81.4	79.2	118.0	111.4	269.9	251.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	371	32714			44521			39988			171964		
Within Groups	367	21567	86		42653	116		39033	106		166529	454	
Difference	4	1147	287	3.33**	1868	467	4.01*	955	239	2.24***	5435	1359	2.99**

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
Area	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean	Post-test CAT	Ad-just-ment Value	Ad-just-ed Mean
1. Aberdeen	74.2	-9.2	65.0	80.1	-5.8	74.3	121.9	-6.3	115.6	276.2	-21.9	254.3
2. Muskogee	70.6	-4.2	66.4	68.2	-0.8	67.4	115.9	-6.1	109.8	254.7	-10.3	244.4
3. Navajo	56.8	+5.3	62.1	72.0	+4.3	76.3	108.2	+5.0	113.2	237.0	+15.1	252.1
4. Phoenix	60.8	+0.3	61.1	73.2	-0.6	72.6	112.3	-1.0	111.3	246.2	-1.5	244.7
5. Juneau	70.5	-4.5	66.0	81.4	-6.8	74.6	118.0	-4.4	113.6	269.9	-16.6	253.3

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table B19

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN ELEVENTH GRADE SPRING, 1968-SPRING, 1970, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968
1. Aberdeen	106	89	61.0	52.7	72.1	69.8	108.5	99.1	241.6	221.6
2. Muskogee	62	91	62.3	51.0	72.7	69.3	111.2	96.4	246.2	216.6
3. Navajo	209	85	56.0	46.4	70.6	65.2	107.8	94.0	234.4	205.6
4. Phoenix	78	85	55.0	44.7	66.3	62.5	105.8	92.4	226.9	199.6
5. Juneau	29	88	71.0	56.6	86.7	88.2	121.0	111.0	278.7	255.7

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	481	48891			64805			66186			263904		
Within Groups	477	47601	100		63423	133		64814	136		256826	538	
Difference	4	1290	323	**3.23	1382	345	**2.59	1372	343	**2.52	7078	1769	**3.28

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Ad-justment Value	Ad-justed Mean	Post-test CAT	Ad-justment Value	Ad-justed Mean	Post-test CAT	Ad-justment Value	Ad-justed Mean	Post-test CAT	Ad-justment Value	Ad-justed Mean
1. Aberdeen	61.0	-4.1	56.9	72.1	-2.6	69.5	108.5	-2.5	106.0	241.6	-9.7	231.9
2. Muskogee	62.3	-3.2	59.1	72.7	-2.6	70.1	111.2	-1.3	109.9	246.2	-6.6	239.6
3. Navajo	56.0	+2.4	58.4	70.6	+2.7	73.3	107.8	+1.8	109.6	234.4	+7.2	241.6
4. Phoenix	54.7	+4.0	58.7	66.3	+5.1	71.4	105.8	+2.9	108.7	226.9	+12.5	239.4
5. Juneau	71.0	-6.7	64.3	86.7	-17.8	68.9	121.0	-8.9	112.1	278.7	-36.4	242.3

**Significant at the .05 level.

Table B20

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN THE TWELFTH GRADE SPRING, 1968-SPRING, 1970, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968	Post-test CAT Spring 1970	Pre-test CAT Spring 1968
1. Aberdeen	58	97	80.3	71.4	88.6	85.1	119.1	110.8	288.0	267.3
2. Muskogee	6	84	57.0	58.7	68.8	68.7	114.2	102.2	240.0	229.5
3. Navajo	150	82	57.8	51.1	75.6	70.4	110.1	102.5	243.6	223.9
4. Phoenix	59	81	57.6	50.2	76.0	69.3	110.4	99.2	244.0	218.8
5. Juneau	18	93	70.9	67.0	91.3	94.1	122.0	112.1	284.2	273.2

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	288	31397			29240			31530			119936		
Within Groups	284	30722	108		27838	98		31022	109		115609	407	
Difference	4	675	169	***1.56	1402	350	*3.57	508	127	***1.16	4327	1082	**2.65

ADJUSTED CRITERION MEANS

	Mathematics			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	88.6	-11.7	76.9	288.0	-35.2	252.8
2. Muskogee	68.8	+5.4	74.2	240.0	+5.4	245.4
3. Navajo	75.6	+4.4	80.0	243.6	+11.5	255.1
4. Phoenix	76.0	+5.4	81.4	244.0	+16.7	260.7
5. Juneau	91.3	-18.5	72.8	284.2	-39.5	244.7

*Significant at the .01 level.
**Significant at the .05 level.
***Not significant at the .05 level.

Table B21

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1966-SPRING, 1969, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966
1. Aberdeen	105	95	71.0	54.8	79.7	69.2	116.7	92.5	267.4	216.5
2. Muskogee	20	86	61.0	44.2	73.4	65.5	114.2	86.3	248.5	195.9
3. Navajo	254	79	52.5	42.4	67.2	56.1	102.3	84.9	222.0	183.3
4. Phoenix	116	83	56.0	44.0	67.9	58.2	104.6	86.3	228.5	184.4
5. Juneau	20	91	73.3	50.0	92.5	71.7	123.5	79.9	289.4	201.6

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	512	62660			91662			93405			442609		
Within Groups	508	60128	118		88778	175		83784	165		406050	799	
Difference	4	2532	633	5.35*	2884	721	4.12*	9621	2405	14.58*	36559	9140	11.43*

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	71.0	-11.1	59.9	79.7	-10.8	68.9	116.7	-6.8	109.9	267.4	-28.8	238.6
2. Muskogee	61.0	+0.3	61.3	73.4	-4.9	68.5	114.2	-0.3	113.9	248.5	-4.3	244.2
3. Navajo	52.5	+4.3	56.8	67.2	+4.8	72.0	102.3	+2.4	104.7	222.0	+11.3	233.3
4. Phoenix	56.0	+1.6	57.6	67.9	+2.1	70.0	104.6	+0.5	105.1	228.5	+4.3	232.8
5. Juneau	73.3	-5.9	67.4	92.5	-11.7	80.8	123.5	+2.2	125.7	289.4	-12.9	276.5

*Significant at the .01 level.

Table B22

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1966-SPRING, 1969, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966	Post-test CAT Spring 1969	Pre-test CAT Fall 1966
1. Aberdeen	84	92	72.7	57.2	77.3	72.8	120.0	99.3	270.1	229.3
2. Muskogee	25	91	69.8	51.0	68.6	70.3	116.2	101.8	254.6	223.1
3. Navajo	189	78	56.6	45.4	70.8	62.7	107.2	91.0	234.6	199.2
4. Phoenix	121	84	62.9	51.2	75.9	67.7	113.7	96.2	252.5	215.1
5. Juneau	14	83	76.3	56.0	81.6	71.0	121.2	87.1	279.1	214.1

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	430	43958			62424			53382			227114		
Within Groups	426	42068	99		57824	136		49210	116		214611	504	
Difference	4	1890	473	4.78*	4600	1150	8.47*	4172	1043	9.02*	12503	3126	6.20*

ADJUSTED CRITERION MEANS

Area	Reading			Mathematics			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	72.7	-8.4	64.3	77.3	-7.4	69.9	120.0	-4.8	115.2	270.1	-20.5	249.6
2. Muskogee	69.8	-3.4	66.4	68.6	-5.0	63.6	116.2	-6.5	109.7	254.6	-14.1	240.5
3. Navajo	56.6	+5.2	61.8	70.8	+4.9	75.7	107.2	+3.4	110.6	234.6	+13.6	248.3
4. Phoenix	62.9	-1.2	61.7	75.9	-0.9	75.0	113.7	-1.3	112.4	252.5	-3.8	248.7
5. Juneau	76.3	-4.6	71.7	81.6	-3.6	78.0	121.2	+5.6	126.8	279.1	-2.7	276.4

*Significant at the .01 level.

Table B23

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN ELEVENTH GRADE FALL, 1967-SPRING, 1970, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967
1. Aberdeen	122	90	62.2	49.2	72.5	61.7	109.5	94.5	244.3	205.4
2. Muskogee	44	93	63.7	49.0	70.9	60.3	107.4	98.4	241.9	207.7
3. Navajo	247	84	54.9	42.9	68.5	56.5	106.1	89.6	229.5	189.1
4. Phoenix	83	84	53.9	42.8	64.9	53.1	103.9	88.7	222.7	184.6
5. Juneau	46	89	69.1	49.6	82.8	68.5	119.8	101.3	271.6	219.4

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	539	69078			84305			79695			374557		
Within Groups	535	66771	125		83219	155		76305	142		361096	675	
Difference	4	2307	577	4.62*	1086	271	1.74***	3390	847	5.94*	13461	3365	4.98*

ADJUSTED CRITERION MEANS

Area	Reading			Language			Total Battery		
	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	62.2	-4.1	58.1	109.5	-2.3	107.2	244.3	-10.6	233.7
2. Muskogee	63.7	-5.0	58.7	107.4	-5.6	101.8	241.9	-15.0	226.9
3. Navajo	54.9	+2.7	57.6	106.1	+2.3	108.4	229.5	+8.0	237.5
4. Phoenix	53.9	+2.9	56.8	103.9	+2.9	106.8	222.7	+11.8	234.5
5. Juneau	69.1	-4.1	65.0	119.8	-6.1	113.7	27[illegible].6	-21.9	249.7

*Significant at the .01 level.
***Not significant at the .05 level.

Table B24

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN TENTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1967-SPRING, 1970, BY AREA

Area	N	CTMM IQ	Reading		Mathematics		Language		Total Battery	
			Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967	Post-test CAT Spring 1970	Pre-test CAT Fall 1967
1. Aberdeen	58	97	80.6	67.2	87.8	81.3	118.6	108.6	286.9	257.1
2. Muskogee	8	84	58.5	51.0	63.4	61.4	112.4	100.5	234.3	212.9
3. Navajo	177	81	56.6	47.6	74.3	67.6	109.4	98.9	240.2	214.1
4. Phoenix	62	82	57.5	47.1	74.9	65.8	110.5	100.1	242.9	213.1
5. Juneau	26	90	70.0	59.2	86.3	78.7	120.9	106.0	277.2	244.0

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	328	37085			37899			39659			177785		
Within Groups	324	36826	114		37206	115		39042	120		176313	544	
Difference	4	259	65	***0.57	693	173	***1.50	617	154	***1.28	1472	368	***0.67

ADJUSTED CRITERION MEANS

None

***Not significant at the .05 level.

Table B25

MEAN SCORES OF CRITERION AND CONTROL VARIABLES WITH ANALYSIS OF COVARIANCE AND ADJUSTED CRITERION MEANS OF STUDENTS PRETESTED IN NINTH GRADE AND POST-TESTED IN TWELFTH GRADE FALL, 1966-SPRING, 1970, BY AREA

			Reading		Mathematics		Language		Total Battery	
Area	N	CTMM IQ	Post-test CAT Spring 1970	Pre-test CAT Fall 1966	Post-test CAT Spring 1970	Pre-test CAT Fall 1966	Post-test CAT Spring 1970	Pre-test CAT Fall 1966	Post-test CAT Spring 1970	Pre-test CAT Fall 1966
1. Aberdeen	72	96	78.9	56.3	86.6	70.6	118.1	93.5	283.6	220.5
2. Muskogee	20	88	64.1	46.8	79.5	69.5	117.3	87.5	261.1	203.7
3. Navajo	217	80	55.6	42.9	72.6	56.7	107.2	85.8	235.4	185.5
4. Phoenix	94	85	59.8	45.1	77.5	62.2	110.4	88.1	247.8	195.5
5. Juneau	18	91	74.0	49.7	93.1	69.4	122.6	79.7	289.7	198.8

ANALYSIS OF COVARIANCE

Source of Variation	Degrees of Freedom	Reading			Mathematics			Language			Total Battery		
		ss	ms	F	ss	ms	F	ss	ms	F	ss	ms	F
Total Sample	418	62529			80501			79225			402575		
Within Groups	414	600241	145		78666	190		74787	181		382410	924	
Difference	4	2288	572	3.93*	1835	459	2.41**	4438	1110	6.14*	20165	5041	5.45*

ADJUSTED CRITERION MEANS

	Reading			Mathematics			Language			Total Battery		
Area	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean	Post-test CAT	Adjustment Value	Adjusted Mean
1. Aberdeen	78.9	-13.0	65.9	86.6	-11.0	75.6	118.1	-7.0	111.1	283.6	-30.7	252.9
2. Muskogee	64.1	-2.1	62.0	79.5	-7.7	71.8	117.3	-1.1	116.2	261.1	-10.3	250.8
3. Navajo	55.6	+4.6	60.2	72.6	+5.3	77.9	107.2	+2.3	109.5	235.4	+11.8	247.2
4. Phoenix	59.8	+0.9	60.7	77.5	-0.6	76.9	110.4	-0.3	110.1	247.8	-0.2	247.6
5. Juneau	74.0	-5.6	68.4	93.1	-8.6	84.5	122.6	+2.6	125.2	289.7	-7.9	281.8

*Significant at the .01 level.
**Significant at the .05 level.

APPENDIX C

STUDENT QUESTIONNAIRE

Please Print

Name ______________, ______________, ______________ ______________
Last First Middle Identification Number

School Name ______________________________ ☐☐

Address ______________________________ ______________
Street and Number, or Place of Residence Now City State

Sex Male ☐ Female ☐

Birthday ______________ ☐☐☐☐
Month Day Year of Birth

What grade are you in now? 9th ☐ 10th ☐ 11th ☐ 12th ☐

Tribal Membership ______________________________ ☐☐

1. Do you live on the Reservation? Yes ☐ No ☐ Don't Know ☐

2. Has your family ever lived off the Reservation? Yes ☐ No ☐ Don't Know ☐

3. Does your father work at some job for at least eleven months each year? Yes ☐ No ☐ Don't Know ☐

4. Does your mother work at some job for at least eleven months each year? Yes ☐ No ☐ Don't Know ☐

5. What is your telephone number at home? ______________ None ☐

6. What type of TV set do you have in your home? Black and White ☐ Color ☐ None ☐

7. Do your parents read a newspaper every day? Yes ☐ No ☐ Don't Know ☐

What was the highest grade in school that your

8. Father completed? ______________

9. Mother completed? ______________

10. Did either of your parents receive any education or training other than BIA, mission or public schools?

Yes ☐ No ☐ Don't Know ☐

If your answer is Yes, tell what the training was for each parent.

11. ____________________

12. ____________________

13. What language does your family speak most of the time at home?

English ☐ Native-American ☐ Spanish ☐ Other ☐

14. Could you speak English when you started school? Yes ☐ No ☐

15. Are you full-blooded Indian? Yes ☐ No ☐

16. Have you ever dropped out of school or left school for a half-year? Yes ☐ No ☐

17. Do you know how to take part in tribal ceremonies? Yes ☐ No ☐

18. How old were you when you started school? ____________ ☐☐

19. Have you attended public school for at least six months? Yes ☐ No ☐

20. Have you attended mission school for at least six months? Yes ☐ No ☐

21. Is your father living? Yes ☐ No ☐ Don't Know ☐

22. Is your mother living? Yes ☐ No ☐ Don't Know ☐

23. Are your parents divorced? Yes ☐ No ☐ Don't Know ☐

24. Are your parents separated? Yes ☐ No ☐ Don't Know ☐

25. Does your family receive any welfare assistance? Yes ☐ No ☐ Don't Know ☐

APPENDIX D

Participant High Schools

School Type	School	Location
(3)	Alchesay	Whiteriver, Arizona
(3)	Chinle	Chinle, Arizona
(4)	Cuba	Cuba, New Mexico
(2)	Flandreau	Flandreau, South Dakota
(1)	Fort Wingate	Fort Wingate, New Mexico
(4)	Gallup	Gallup, New Mexico
(3)	Ganado	Ganado, New Mexico
(4)	Globe	Globe, Arizona
(4)	Hartshorne	Hartshorne, Oklahoma
(4)	Hoonah	Hoonah, Alaska
(2)	Intermountain	Brigham City, Utah
(4)	J.F. Kennedy Jr. HS	Gallup, New Mexico
(2)	Mount Edgecumbe	Mount Edgecumbe, Alaska
(4)	Nome	Nome, Alaska
(1)	Oglala	Pine Ridge, South Dakota
(4)	Parker	Parker, Arizona
(2)	Sequoyah	Tahlequah, Oklahoma
(4)	Sisseton	Sisseton, South Dakota
(4)	Stillwell	Stillwell, Oklahoma
(3)	Todd County	Mission, South Dakota
(3)	Window Rock	Window Rock, Arizona
(4)	Winnebago	Winnebago, Nebraska
(3)	Zuni	Zuni, New Mexico

(1) Federal on-reservation
(2) Federal off-reservation
(3) Public on-reservation
(4) Public off-reservation